

JULY, 1952

# Railway Engineering and Maintenance

Norfolk  
and Western  
RAILWAY.



## THE POWHATAN ARROW THE POCOHONTAS

The Norfolk and Western is one of the nation's largest haulers of bituminous coal. It is powered exclusively by coal-burning locomotives of unique and modern design built in their own shops. All its main line is laid with rails of 130-lb. or heavier and is maintained to the highest track standards. It is also noted for its fine passenger service. The Powhatan Arrow and the Pocahontas, operating between Norfolk and Cincinnati are known as two of the country's fine trains.



THE P.&M.CO.

CAGO • NEW YORK • DENVER • WASHINGTON • ST. LOUIS • CLEVELAND • ST. PAUL • BOSTON • SAN FRANCISCO



## *Safety with economy* when you equip every track joint bolt with **RELIANCE HY-PRESSURE**

IT REQUIRES "work a plenty" at track level to insure safety of operation at all levels. You can have safety and economy too, by using Reliance Hy-Pressure Hy-Crome spring washers.

Hy-Pressure Hy-Crome spring washers are scientifically developed and manufactured by experienced personnel. They are produced in a modern plant employing the finest equipment. From the hot rolled steel to the carefully finished heat treated product, Reliance spring washers are carefully controlled under the most favorable conditions.

A word from you will bring a visit from one of our railway fastening engineers with some ideas that might be mutually profitable. Hy-Crome washers are made for track joints-frogs-switches-crossings, also for cars and motive power.

**HY-CROME**  
*spring washers*



**"Edgemark of Quality"**

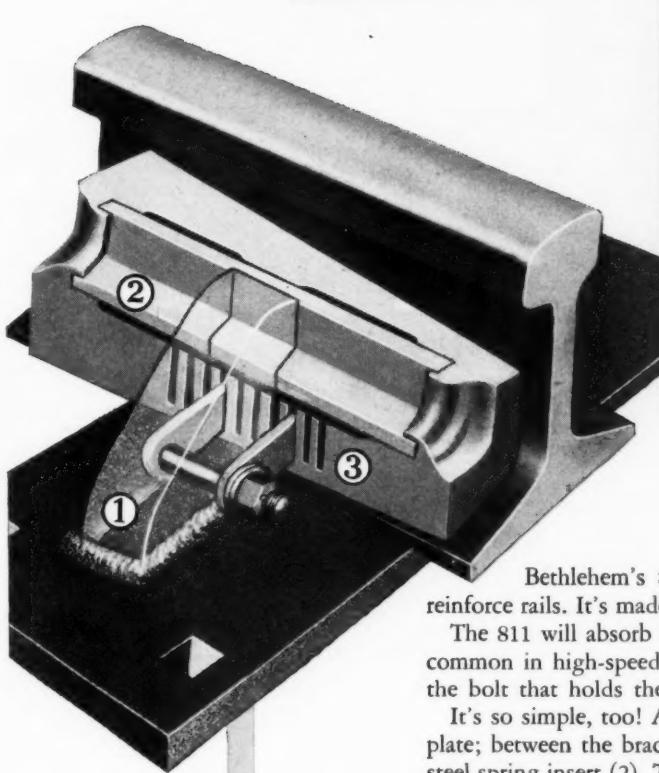


**MANUFACTURING COMPANY, RELIANCE DIVISION**

OFFICE AND PLANTS • MASSILLON, OHIO  
SALES OFFICES: NEW YORK • CLEVELAND • DETROIT • CHICAGO • ST. LOUIS  
SAN FRANCISCO • MONTREAL



# IT BRACES!



Bethlehem's 811 Rail Brace is built for just one purpose—to reinforce rails. It's made to brace and it braces!

The 811 will absorb the most violent side thrust; shake off the impacts common in high-speed traffic. This is a unit that's rugged clear down to the bolt that holds the pawls.

It's so simple, too! A strong bracing part (1) is welded to a special tie-plate; between the bracer and the rail is a wedge, into which is swaged a steel spring insert (2). The spring withstands a high compressive force, and the farther the wedge is driven in, the tighter the fit. Vertical slots (3) enable the pawls to be turned down, so that a positive lock results. No matter how sharp the thrust, this locked wedge can't loosen up; can't pop suddenly out of place.

Ask a Bethlehem man to show you an installation; get him to demonstrate how snugly the 811 fits against the rail. Here's an accessory that's a big investment in safety . . . yet costs surprisingly little.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

*On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation  
Export Distributor: Bethlehem Steel Export Corporation*



THE NORDBERG  
*Power Jack*



*"Mechanical Muscles"\**  
for all raising-reballasting jobs

\* The Nordberg Power Jack will handle any kind of track, and work in any kind of ballast... and will pay for itself in raising only 13.8 miles of track.

SPEED, accuracy, and ease of handling on or off the track are basic advantages of the Nordberg *Power Jack* for reballasting, general surfacing and all other operations where raising of track is involved. Lifting is accomplished by means of hydraulic rams actuated by oil under pressure. Alignment is maintained even when making heavy and high lifts. One Nordberg *Power Jack* easily keeps ahead of any tamping gang.

It will pay you to take advantage of the "mechanical muscles" of the Nordberg *Power Jack* to reduce maintenance costs.

For details, send for BULLETIN 138.

\*Copyright 1952, Nordberg Mfg. Co.

R852



Use NORDBERG  
"Mechanical Muscles"\*\*  
to do a Better, Faster  
Maintenance Job  
at Lower Cost...

ADZING MACHINE • CRIBEX® • BALLASTEX® • SCREENEX® • GANDYR •  
POWER JACK • POWER WRENCH • RAIL DRILL • RAIL GRINDERS • SPIKE PULLER  
• TRAKGAGER • TRACK SHIFTER • DSL YARD CLEANER

NORDBERG MFG. CO., Milwaukee, Wis.



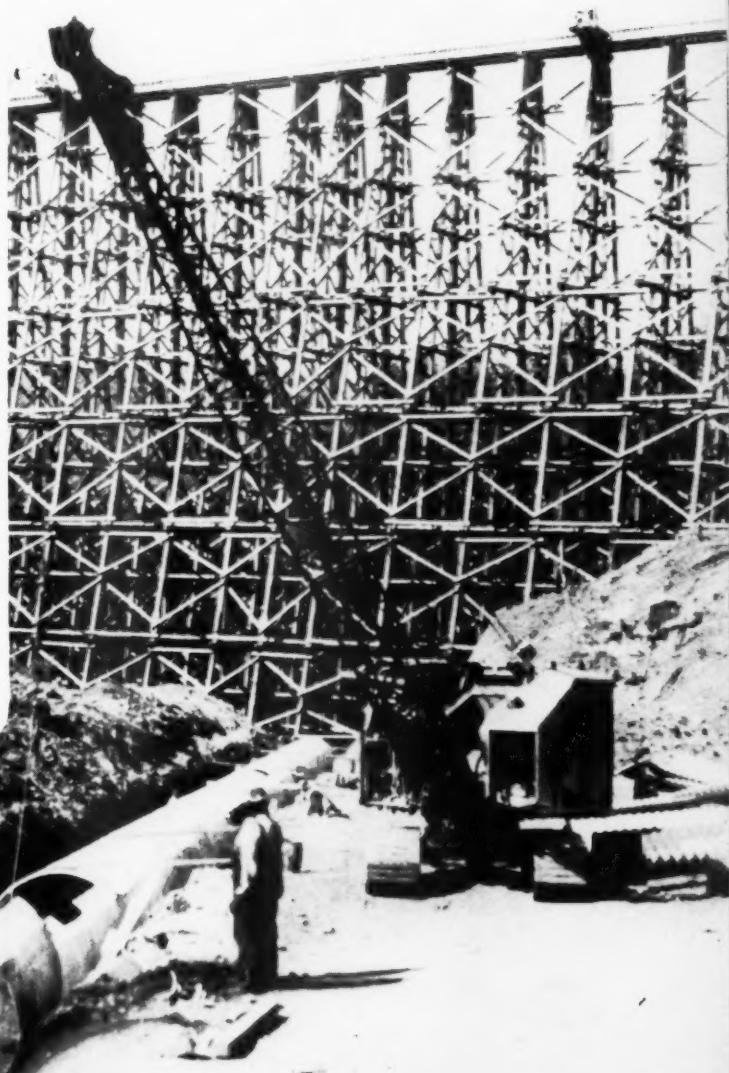
# REROUTING the S. P. & S.

What the Spokane, Portland & Seattle RR did to improve its Deasey branch would make an old time railroader's hair curl. The S. P. & S. traverses some of the most rugged terrain in the West. The problem was one of straightening line and getting rid of old timber bridges that were outliving their usefulness. They cut away mountains and replaced bridges with fills running almost 200 ft. high and over 650 ft. in length. The job was handled by Natt MacDougall Company of Portland, Ore., using four Northwest Shovels.

Natt MacDougall is an old Northwest user and is now operating his tenth Northwest.

Northwests are the rigs for tough back country jobs like this. Simplicity of design makes upkeep easy. Northwest Crawlers with Northwest Steering and Northwest self-cleaning action have the stamina for miles of travel and the negotiation of terrain that gives other machines trouble. The "Feather-Touch" Clutch Control makes operation easy without the complications of pumps and valves and the Northwest Dual Independent Crowd utilizes force other independent crowd shovels waste. Northwests handle tougher digging. They get there—and back and they stay on the job. It's a real railroad rig.

**NORTHWEST ENGINEERING CO.**  
1513 Field Bldg., 135 South La Salle Street  
Chicago 3, Illinois



One of the fourteen culverts set by Northwest for a total of 3604 ft.



# NORTHWEST

THE ALL PURPOSE RAILROAD MACHINE  
SHOVEL • CRANE • DRAGLINE • PULLSHOVEL

DOES  
THINGS  
NO TRACK-TYPE  
RIG CAN DO



HERE'S AN ADVERTISEMENT ANY  
RAILROAD WOULD BE PROUD TO RUN\*



*Relax...*

on RIBBONRAIL when you go to Colossus City

Want the smoothest ride of your life? Then  
ride one of the trains listed below — You  
will literally glide for 120 miles.

For the Mid-West Central  
has installed RIBBONRAIL  
in every foot of the route.  
You'll get a new travel thrill as your train  
swishes over long lengths of continuous  
welded rail from  
which all bumps  
and clickety-clacks  
have been elimi-  
nated.

Mid-West Central To Colossus City — Read Down			From Colossus City — Read Up		
No. 230	No. 232	No. 70	No. 71	No. 231	No. 233
8:00 a.m.	2:00 p.m.	4:20 p.m.	Lv. Markersburg	Ar. 12:10 p.m.	6:00 p.m.
9:45 a.m.	3:45 p.m.	5:20 p.m.	Lv. Wayboro	Ar. 11:25 a.m.	4:05 p.m.
10:45 a.m.	4:35 p.m.	6:00 p.m.	Lv. Mid Town	Ar. 11:02 a.m.	2:55 p.m.
12:30 p.m.	6:15 p.m.	7:30 p.m.	Ar. Colossus City	Lv. 9:00 a.m.	1:00 p.m.



\*

Of course, this advertisement is  
make-believe, there is no Colossus  
City — no Mid-West Railroad... But  
in the very near future you'll see a lot of  
newspaper advertisements like it. And they  
will be real. Why? Because RIBBONRAIL not  
only provides smooth riding for passengers, but  
it cuts track maintenance costs, saving railroads  
thousands of dollars year after year. There are no  
joints to wear, no rail ends to batter with RIBBONRAIL.

**OXWELD RAILROAD SERVICE COMPANY**  
A Division of Union Carbide and Carbon Corporation



Carbide and Carbon Building Chicago and New York  
In Canada:  
Canadian Railroad Service Company, Limited, Toronto

The term "Ribbonrail" is a service mark of Union Carbide and Carbon Corporation.

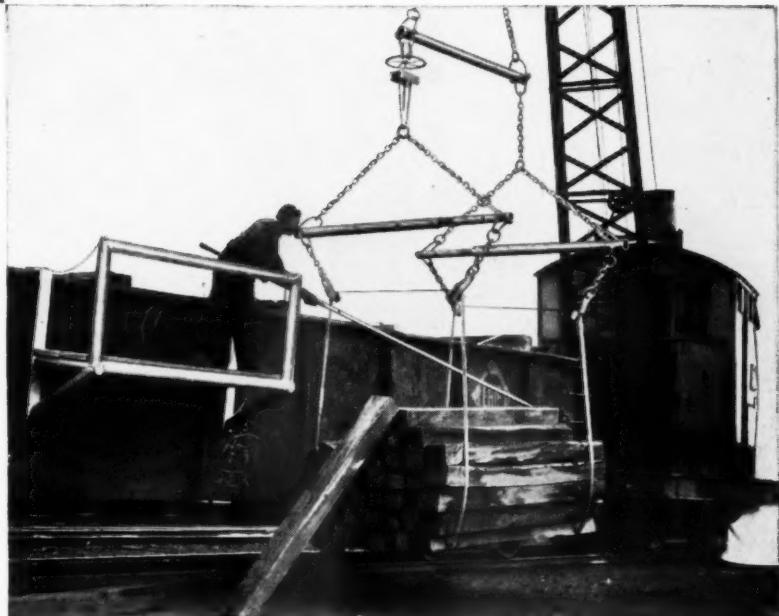
**Ribbonrail**  
SERVICE MARK





## He can show you...

**the proven  
way to cut  
tie-handling  
costs**



**F**IRST used less than two years ago, Brainard's new method of cross-tie distribution has now been adopted by seven major roads ... where it is cutting costs up to 30%.

Brainard men like Frank Houck, who sparkplugged this idea through to success, want to show you how the Brainard method reduces labor requirements to the point where *just two men can handle unit loads of ties*. The loads, after preparation with two special slack bands of steel strapping, are suspended by the lift\*, so that the man on the catwalk

can drop ties one at a time parallel to the track.

As an energetic sales manager, Frank Houck believes in *customer service*. That's why Brainard engineers stand ready to study your operations, make recommendations, and give you plans for the special lift—free of charge to railroads and tie-treating plants for production in their own shops.

Call your local Brainard salesman now. District offices located throughout the U.S.

\*Patented



COMPLETE STEEL STRAPPING SYSTEM, ENGINEERING, STEEL STRAPPING, TOOLS AND ACCESSORIES, ANTI-CHECKING IRONS

For booklet on tie-distribution method, write Brainard Steel Division, Sharon Steel Corporation, Dept. S-7, Griswold St., Warren, Ohio.



WARREN, OHIO

**No More Trenching!**  
**No More Jacking up Track!**

# **This WOOLERY**

**Tie-removing Team Now Eliminates**  
**This Slow, Costly Method!**

Use the WOOLERY TIE-END REMOVER in conjunction with the improved model NU WOOLERY TIE CUTTER! It's the *perfect team* for greater savings on tie renewals—and gives *smoother, safer track, too!*



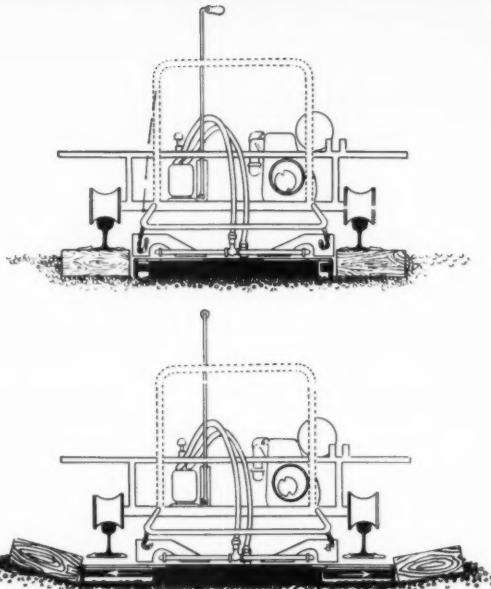
After the tie has been cut on both sides by the WOOLERY Tie Cutter, the operator of the Tie-end Remover—(who follows closely behind so that operators can assist each other in removing machines from track)—lifts the center section out with tie tongs.

2 A double-ended hydraulic cylinder is then lowered into the tie bed.

3 A simple turn of the valve moves these two pistons outward, pushing the tie-ends completely clear of the rail—whether working with single or double shoulder tie plates! The crib is now open—and only the necessary amount of ballast is removed to admit the new tie.

The trend toward heavier rail and double shoulder tie plates has made removing tie-ends increasingly difficult. With the WOOLERY Tie-end Remover, this task can now be done in *less than a minute by one man with no more effort than that required to turn a valve!* See how simply and efficiently this WOOLERY team works—follow the "1-2-3" steps of tie-removal.

There has been no trenching or jacking up of track—thus line and surface of track are maintained, soft spots and humpy track are eliminated—the new tie rests on a firm bed and little or no tamping is necessary!



**Woolery** SINCE 1917 RAILWAY MAINTENANCE EQUIPMENT  
**MACHINE COMPANY**  
2919 COMO AVE. S.E. MINNEAPOLIS 14, MINN.

Exclusive Export Representatives  
PRESSED STEEL CAR CO., NEW YORK, N.Y.

#### S P E C I F I C A T I O N S

- ENGINE Wisconsin air-cooled 4-6 H.P.
- PUMP 1,500 P.S.I. built-in relief valve, 1 gal. reservoir.
- DRIVE Double V-belt.
- CYLINDER 3" bore, honed finish, double-ended, double-acting. Hardened, ground and chrome plated rams equipped with rod wipers.
- TRACK ROLLERS 6" self-centering, insulated.
- NET WEIGHT 360 pounds.
- CRATED WEIGHT 490 pounds.



# Versatile tool

**ON THE NORTHERN PACIFIC'S  
IMPROVEMENT PROGRAM!**

This "Caterpillar" D6 Tractor with matching No. 60 Scraper is just one of many big yellow machines working for the Northern Pacific. On this job along the right-of-way near Carlton, Minnesota, it's building passing track along the present main-line track. The operation takes in loading dirt from ditches along the right-of-way and making the new roadbed. The No. 60 loads, hauls and spreads a 7 to 8 yard load every 18 minutes on a haul distance of about  $\frac{1}{4}$  mile. As you can see, the going's rough. The Northern Pacific also uses the No. 60 for general off-track chores and snowplowing.

Here's a brief, over-all picture of

"Caterpillar" equipment's part in the Northern Pacific's improvement program from L. L. Perrin, Advertising Manager. "Like other large rail systems, we've converted from steam locomotives to the high-speed Diesel capable of handling very large freight trains at fast speeds. This new improvement calls for better roadbeds, heavier rails and longer passing tracks. We're bank widening, back-sloping cuts and increasing the length of passing tracks. We find 'Caterpillar' machines very reliable and economical to operate."

Before investing in any equipment for right-of-way use, be sure to check with

your "Caterpillar" Dealer about the performance of the versatile yellow scrapers. He'll talk *facts* with you, so you'll get a down-to-earth idea of exactly how they fit into your picture. He's as close as your phone — call him today!

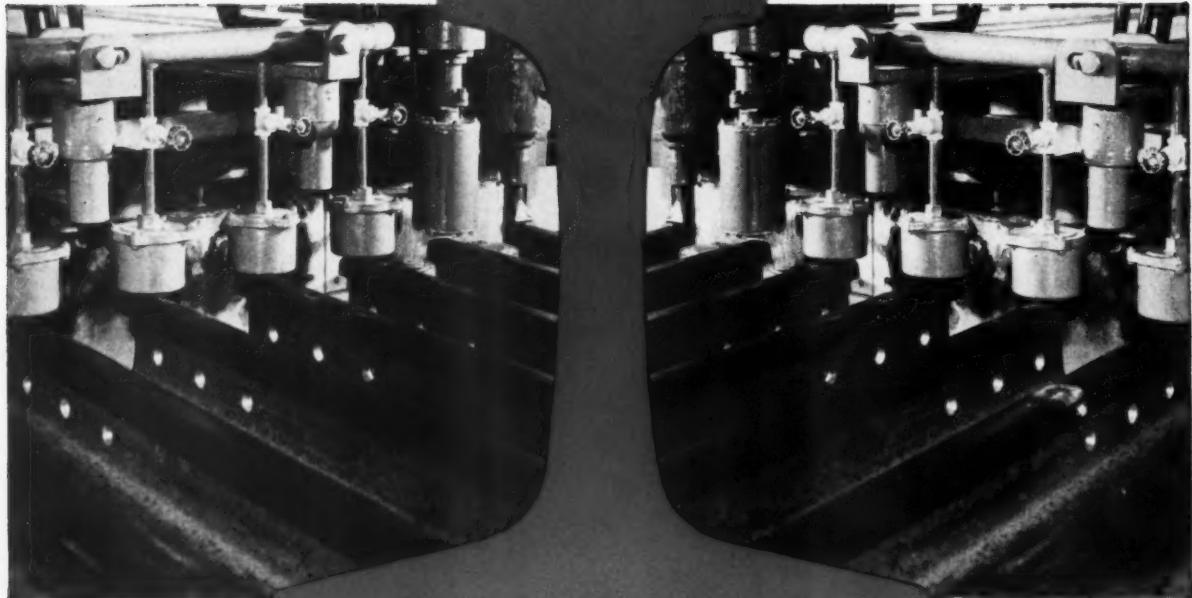
**CATERPILLAR, PEORIA, ILLINOIS**

**CATERPILLAR**

REG. U. S. PAT. OFF.

**DIESEL ENGINES  
TRACTORS • MOTOR GRADERS  
EARTHMOVING EQUIPMENT**

*to withstand rail-end wear . . .*



**MILL  
END-HARDENED  
RAILS  
FOR  
WESTERN  
RAILROADS**

Greater speeds and heavier payloads require rails that can deliver increased performance. Western Railroad needs are met with CF&I End-Hardened Rails.

Precision equipment, consisting of successive radiant heating units and a compressed air quench, simultaneously end-hardens both ends of each CF&I rail.

Automatic controls assure accuracy of required temperature, heating time and quench. This method provides rails with uniform hardness patterns.

You are invited to visit our Pueblo Plant to inspect these new facilities.

**RAILS AND ACCESSORIES**

THE COLORADO FUEL AND IRON CORPORATION

DENVER, COLORADO



YOUR **EXTRA EMPLOYEE** THAT WORKS WITHOUT PAY

# RACINE

## *Unit*

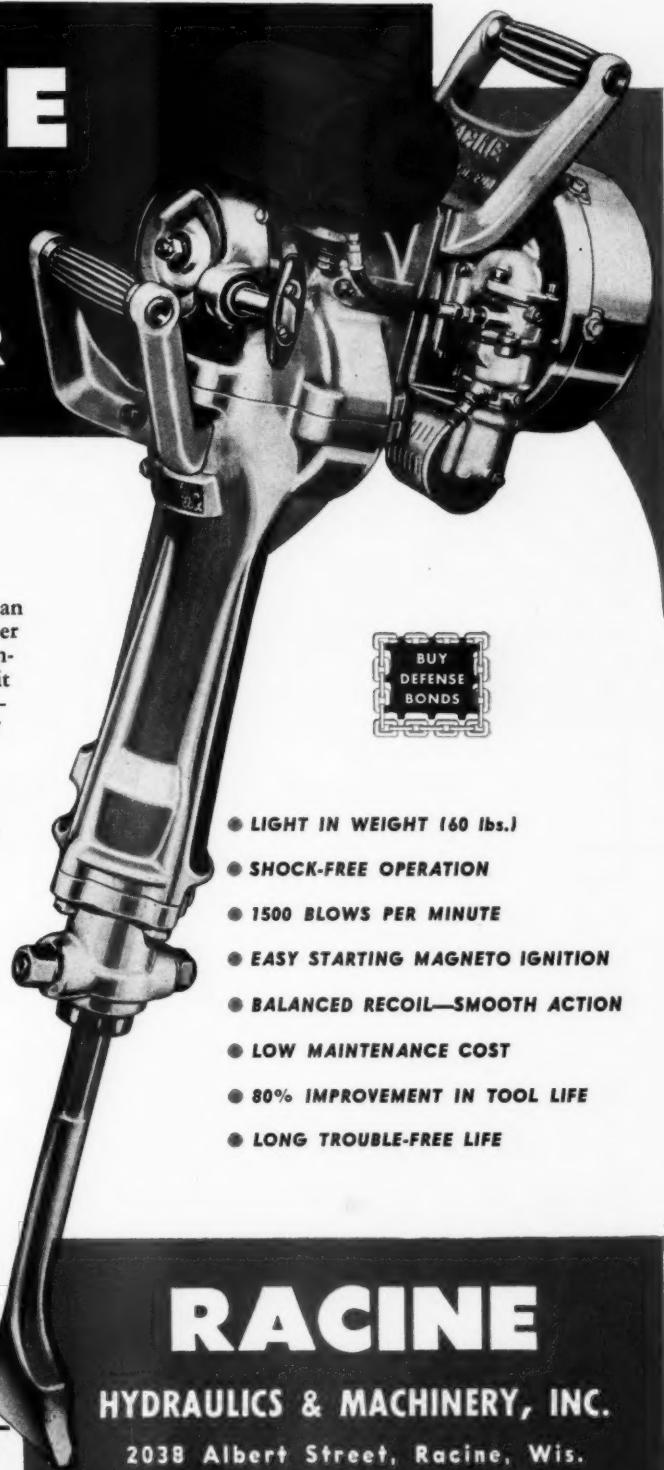
### TIE TAMPER



If you had an extra man working eight hours per day, you'd notice the increase in tamped track. A Racine Unit Tie Tamper provides that increase — **GIVING YOU THE EQUIVALENT OF EIGHT HOURS MORE WORK EVERY DAY.**

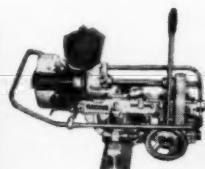
Racine Unit Tie Tamper speed up your work and increase manpower efficiency by reducing fatigue. Easily carried, easily operated, shock-free — they team up productively with your operators.

You get longer tool life with less machine maintenance, more uniformly compacted ballast that remains properly placed longer. All these are extras that make the Racine Unit Tie Tamper a valuable employee to serve you capably for a long, long time. Write for free 3-color catalog.



- **LIGHT IN WEIGHT (60 lbs.)**
- **SHOCK-FREE OPERATION**
- **1500 BLOWS PER MINUTE**
- **EASY STARTING MAGNETO IGNITION**
- **BALANCED RECOIL—SMOOTH ACTION**
- **LOW MAINTENANCE COST**
- **80% IMPROVEMENT IN TOOL LIFE**
- **LONG TROUBLE-FREE LIFE**

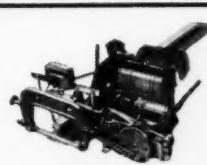
OTHER  
PORTABLE MACHINES  
BY RACINE



Racine Bond Drill



Racine Rail Drill



Racine Rail Cutter

# RACINE

## HYDRAULICS & MACHINERY, INC.

2038 Albert Street, Racine, Wis.



## Here's a low-cost trestle replacement

When tired trestles play havoc with maintenance budgets the simple solution is to replace them quickly and economically with Armco MULTI-PLATE Structures.

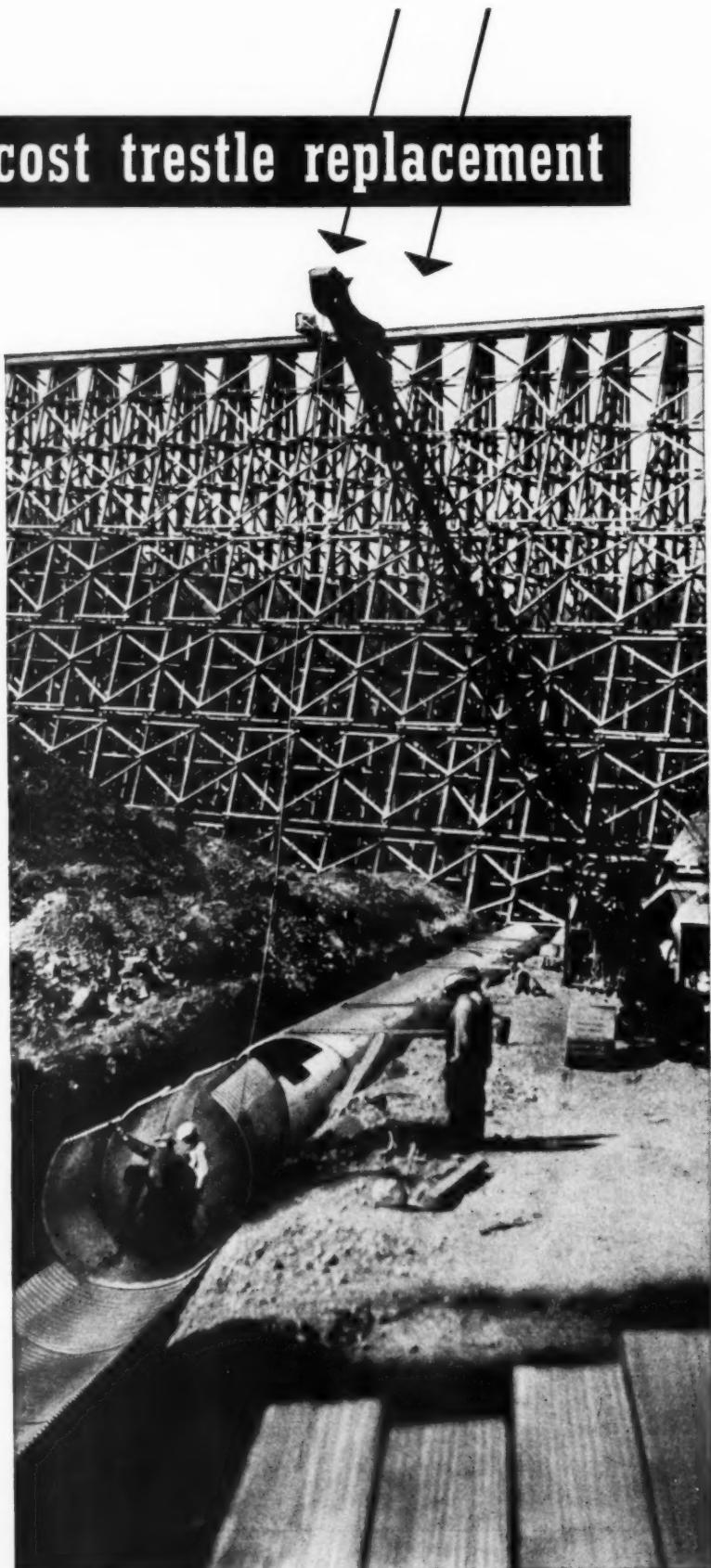
Both purchasing agents and engineers like MULTI-PLATE because of its low cost, strength, durability and ease of installation. Individual, pre-curved sections are easily transported, ready for quick assembly by unskilled crews. Backfilling follows immediately because there's no formwork or delay for curing.

Armco MULTI-PLATE Structures have ample strength to withstand heavy railroad loadings under shallow or high fills. Nearly half a century of satisfactory railroad service is assurance of their dependability, efficiency and economy.

Keep costs low by specifying Armco MULTI-PLATE Pipe or PIPE-ARCH to replace old structures or for new construction. Write for complete data and also ask about other money-saving Armco railroad products. Armco Drainage & Metal Products, Inc., 2202 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. Export: The Armco International Corporation.



**ARMCO  
DRAINAGE  
STRUCTURES**



# Six-man car that one man can lift rolls smoothly on TIMKEN® bearings

THIS Kalamazoo 56A utility car can carry a crew of six men and tow a heavy load besides. Yet it's light enough for one man to lift on and off the tracks (rear lift approx. 110 lbs.). Used for patrol, inspection or to carry a work crew, the car rolls smoothly with Timken® tapered roller bearings on the axles.

The true rolling motion of Timken bearings plus the smooth finish of their rollers and races practically eliminate friction. Wear

is minimized, breakdowns avoided. Wheels turn freely.

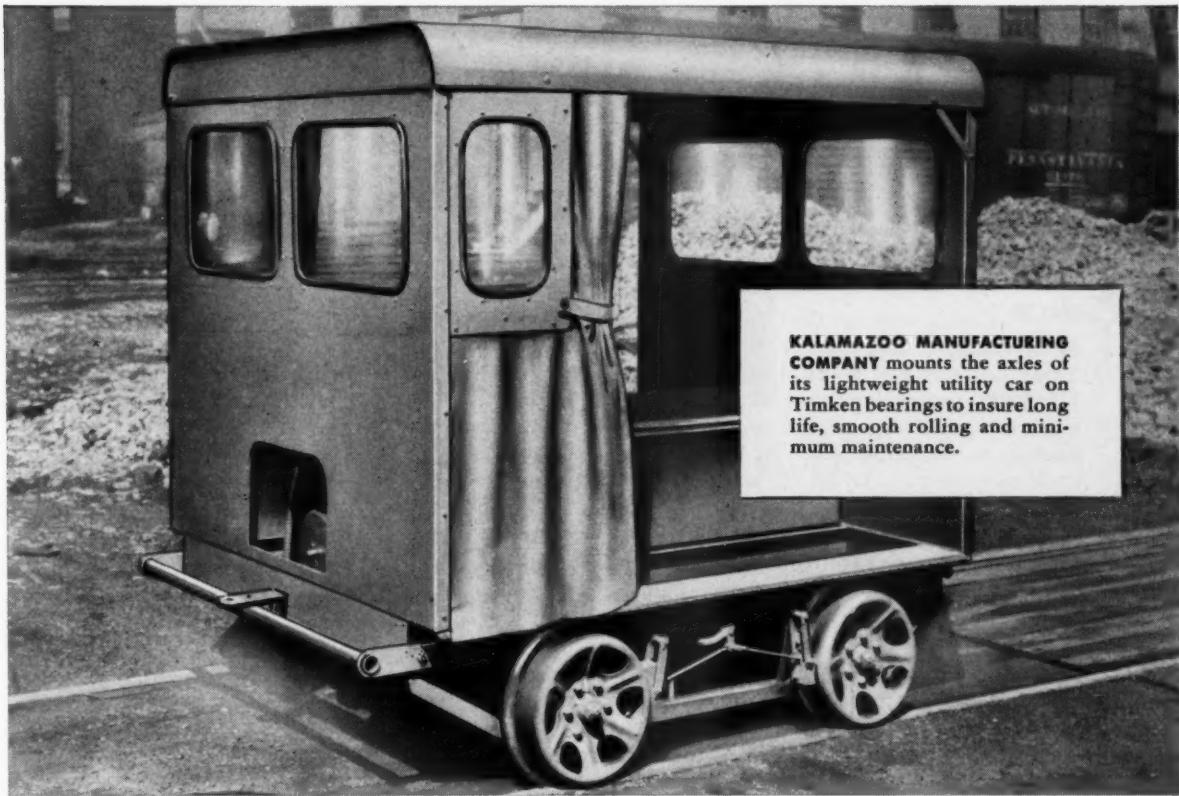
Since Timken bearings keep housings and shaft concentric, they make closures more effective. Lubricant stays in, reducing maintenance. Dirt stays out, reducing wear.

Line contact between roller and races on Timken bearings provides load-carrying capacity to spare. They take heavy shock loads with ease, prevent utility car breakdowns on the right of way.

No other bearing can give you all the advantages you get with Timken bearings. Make sure you have them in the equipment you buy or build. Look for the trademark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".



*This symbol on a product means its bearings are the best.*



KALAMAZOO MANUFACTURING COMPANY mounts the axles of its lightweight utility car on Timken bearings to insure long life, smooth rolling and minimum maintenance.

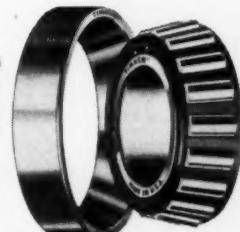


## WE MAKE OUR OWN STEEL

The special grade alloy steel which gives Timken bearings their strength and resistance to wear is made in our own steel mills.

The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis steels.

**TIMKEN**  
TRADE-MARK REG. U. S. PAT. OFF.  
**TAPERED ROLLER BEARINGS**



NOT JUST A BALL • NOT JUST A ROLLER • THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION



Central Railroad Co. of Pennsylvania is engaged in an extensive improvement project at its Allentown Yards and this big Model HM 4-wheel-drive "PAYLOADER" tractor-shovel has been in the thick of it for a year and a half — grading, excavating, loading and unloading material from cars . . . hauling rails, ties and track equipment . . . laying rail and making itself useful in many ways.

Big pneumatic tires with 4-wheel-drive work on any ground and walk over railroad tracks; 19 m.p.h. top speed takes it quickly to any place on the 3½ mile project; 1½ cu. yd. bucket can handle 3 tons at a time.

T. J. Reagan, Supervisor of the Allentown Project, says, "We are very pleased with its performance and would highly recommend it for the work it has been performing."

Four speeds in each direction, power-boosted steering and hydraulic control are other reasons why the Model HM "PAYLOADER" is a mobile, versatile "one-man work-train." "PAYLOADER" distributors, located throughout the U. S. and Canada, have complete parts and service facilities and are ready to give you additional data. The Frank G. Hough Co., 751 Sunnyside Ave., Libertyville, Illinois.



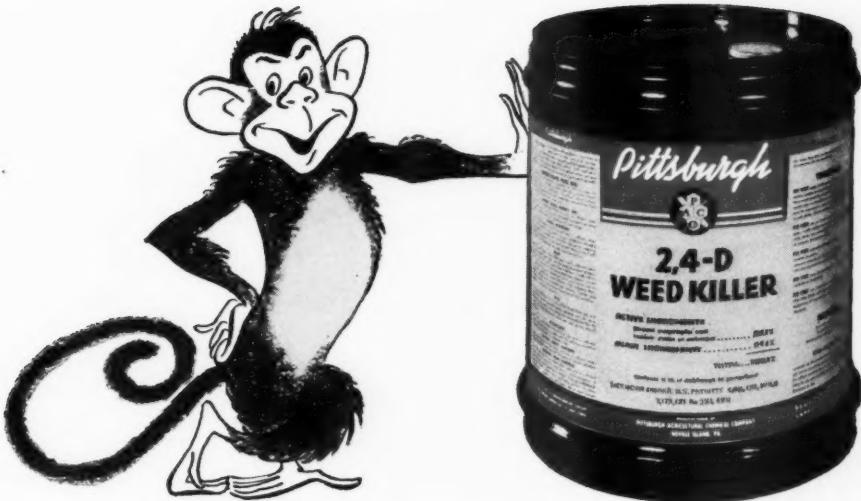
**IT'S A "ONE-MAN  
WORK TRAIN" —  
fast to the job...  
fast on the job**

Load, carry and spread ballast  
Maintain shoulders  
Fill bridge and culvert abutments  
Grade for track  
Handle coal at storage piles  
Cut drainage ditches  
Load ballast from stockpiles  
Clear slides and wash-ins  
Lay rip-rap  
Level station grounds  
Plow and load snow  
Handle rails, ties, supplies

**write**

for FREE LITERATURE on the big 1½ cu. yd. 4-wheel drive "PAYLOADER" or any of the six smaller sizes.





## Why Monkey around with "just any" Weed Killer when you can buy



### Quality Controlled 2, 4-D?

If you need a really effective weed killer with consistent peak quality, you'll find that it pays to buy Pittsburgh 2,4-D. This efficient, selective weed killer is *Quality-Controlled* from coal to finished chemical at our own basic and integrated

agricultural chemical plant. And that's your best possible assurance of top performance and a dependable supply. We'll gladly send you free information bulletins on Pittsburgh 2,4-D. Write today.

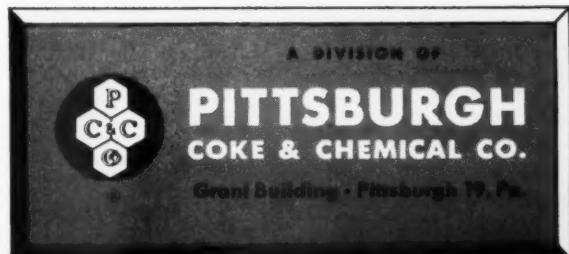
#### PITTSBURGH AGRICULTURAL CHEMICAL COMPANY

7601 EMPIRE STATE BUILDING, NEW YORK 1, NEW YORK

*Standard for Quality*

**ORGANIC INSECTICIDES:** Benzene Hexachloride, Toxaphene, Dichloro Diphenyl Trichloroethane, Aldrin, Dieldrin, Chlordane. **ORGANIC PHOSPHATE INSECTICIDES:** Parathion Wettable Powders, Parathion Liquid Concentrate, Metacide. **WEED KILLERS:** 2,4-D Acid, 2,4-D Amine Concentrates, 2,4-D Ester Formulated Concentrates, 2,4-D Sodium Salt Monohydrate, 2,4,5-T Formulations. **FUNGICIDES, SEED DISINFECTANTS, COTTON SPRAYS AND DUSTS, AND OTHER SPECIAL AGRICULTURAL CHEMICALS.**

WAD 4015



COAL CHEMICALS • AGRICULTURAL CHEMICALS • PROTECTIVE COATINGS • PLASTICIZERS • ACTIVATED CARBON • COKE • CEMENT • PIG IRON



Fully worn bar (center) shows extent of deterioration prior to shop build-up and hardfacing. Outer bars shown have been hardfaced. Reclamation of these tamper bars is effected for a fraction of the cost of new bars.



Close-up of hardfaced bars and shoes ready for service.



One man, one holder, and Airco No. 361 electrodes can handle the build-up operation.

## SAVE ON TAMPER BAR AND SHOE REPAIR with Airco Hardfacing Alloys

Maintenance-of-way personnel are all too familiar with the condition of tamper bars and shoes after a few days of beating coarse-hard aggregate to pack in track ballast.

Many roads have found a way to economically extend tamper bar and shoe service life with Air Reduction hardfacing electrodes. Here's how.

A routine build-up program using Airco No. 361 electrodes brings the worn parts back to size. Following the size build-up, Airco Tungtube No. 20

electrodes provide a hardfaced surface which lasts two to three times longer in service than untreated bars. These road-tested Airco electrodes are your guarantee of sound hard-metal deposits at minimum cost.

You can learn how Airco Hardfacing techniques can effect savings for your maintenance-of-way abrasion and impact resistant operations. An experienced Airco Railroad Representative is ready to supply you the full details. Just write him at your nearest Airco Office.



### AIR REDUCTION

AIR REDUCTION SALES COMPANY • AIR REDUCTION MAGNOLIA COMPANY

AIR REDUCTION PACIFIC COMPANY

REPRESENTED INTERNATIONALLY BY AIRCO COMPANY INTERNATIONAL

Divisions of Air Reduction Company, Incorporated

Offices in Principal Cities

*at the frontiers of progress you'll find*



# Complete BRUSH and WEED KILLING SERVICE



PIONEER in the improved  
right-of-way brush control



Spraying  
equipment  
specifically  
designed  
and proven  
for the  
purpose



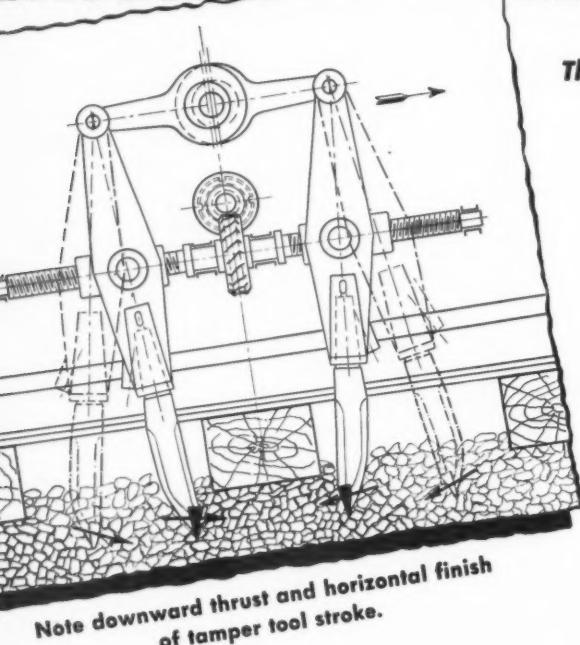
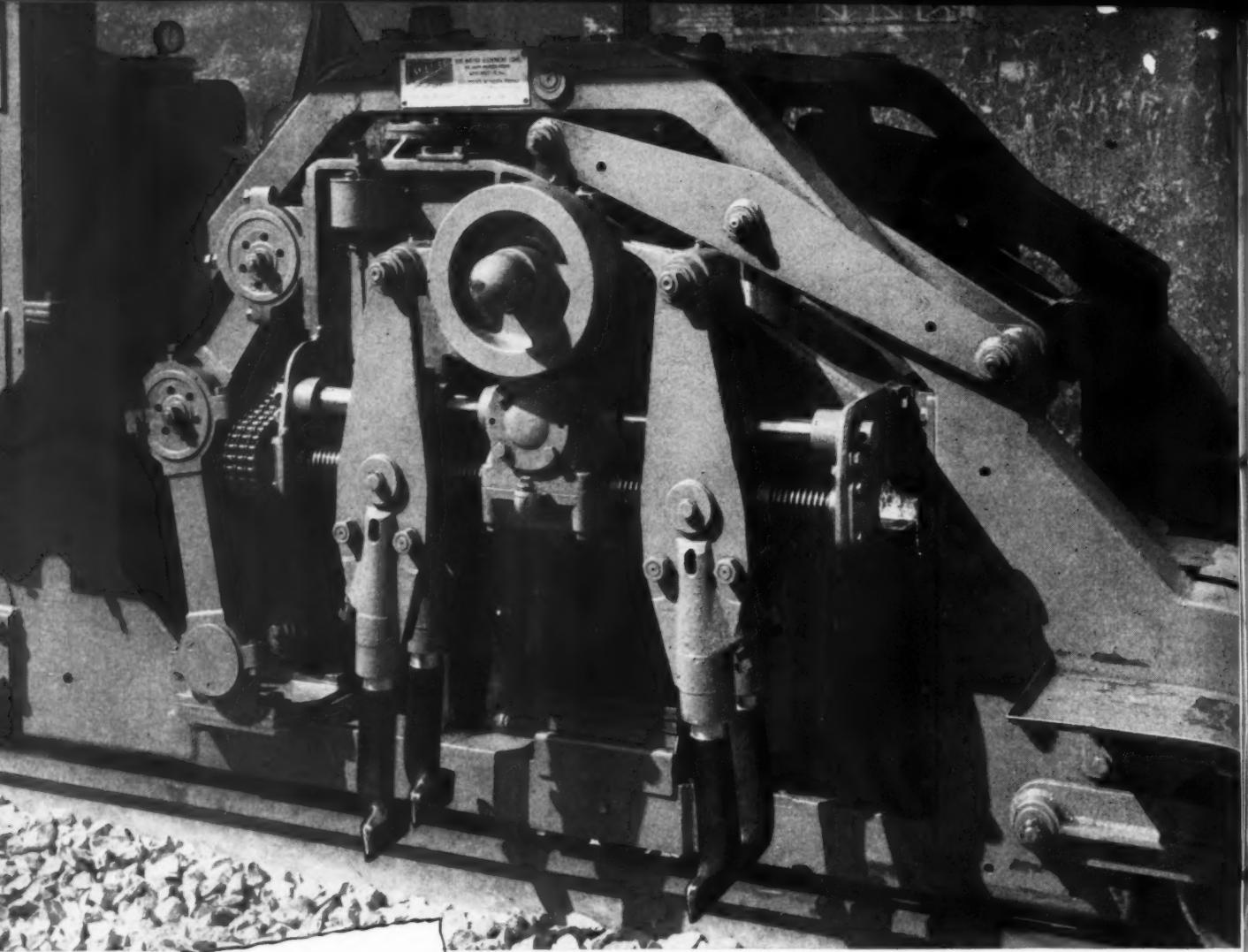
LEADER in effective grass  
and weed killing control

- TCA
- OILS
- 2, 4-D
- PENTACHLOROPHENOL
- BRUSH KILLERS

**Spray Services**  
*Incorporated*

Pioneers in Right-of-Way Spraying

P. O. BOX 5444      HUNTINGTON, W. VA.



Note downward thrust and horizontal finish  
of tamper tool stroke.

**3** Basic Types of Mechanical Tamping:

### **BRUTE FORCE**

*to ram ballast into place.*

### **PERSUASION**

*to urge ballast into place.*

### **FORCEFUL PERSUASION**

*which combines pressure—not pounding action—and vibration to give the uniform compaction as produced by the*

*Matisa*  
**TAMPER**

**THE MATISA EQUIPMENT CORPORATION**  
224 South Michigan Blvd. • Chicago 4, Illinois

**TRACKWORK SPECIALISTS ALL OVER THE WORLD**



# NEWS NOTES...

**...a resumé of current events throughout the railroad world**

JULY, 1952

Westbound "transcontinental" time freight schedules from Chicago, St. Louis and west thereof were reduced by a full day, effective on various dates from June 2 to 8, inclusive. This means fifth day arrival and sixth morning placement at California, Oregon and Washington points for freight out of Chicago, St. Louis and other interchange points, and fifth morning placement for freight out of the Twin Cities via the northern lines to Seattle, Portland and Tacoma.

•  
Movement of a heavy winter wheat crop from the southwest is now well underway. Increased car ownership of the southwestern Granger roads, plus careful advance planning, has assured a much easier car situation than in 1951. However, official estimates are that the southwestern roads will be required to handle a wheat crop 91.5 per cent larger than last year.

•  
Settlement of the long standing wage and rules dispute involving three operating brotherhoods resulted in the termination of government control and army operation of the railroads on May 23. The unions involved were the Brotherhood of Locomotive Engineers; the Brotherhood of Locomotive Firemen and Enginemen; and the Order of Railway Conductors.

•  
Estimated net income, after interest and rentals, of the Class I railroads in the first four months of this year was \$186 million, as compared with a net income of \$153 million for the first four months last year. Estimated results for April 1952 showed net income of \$45 million, as compared with \$46 million in April 1951. These figures were compiled by the Bureau of Railway Economics of the Association of American Railroads.

•  
Greatly reduced round-trip coach fares for small groups and families were put into effect by 14 eastern railroads on June 25. Designed to attract persons who otherwise would travel by automobile, the new fares will cut railroad travel costs to near pre-war levels for groups of three or more adults and for families traveling together.

•  
Two of the country's most prominent name trains recently celebrated their 50th birthdays—both on June 15. One was the Twentieth Century Limited of the New York Central, and the other was the Broadway Limited of the Pennsylvania. Both trains operate between New York and Chicago.

•  
Purchases by domestic railroads of all types of materials amounted to \$693,249,000 during the first three months of 1952, according to figures compiled by the Railway Age. During the equivalent period of 1951, purchases aggregated \$1,007,844,000. Rail purchases for the three months aggregated \$22,846,000, as compared with \$23,707,000 in March 1951, while crosstie purchases amounted to \$27,063,000, as compared with \$18,382,000.

## NEWS NOTES (continued)

---

Railroad employment increased from 1,220,658 to 1,229,835 between mid-March and mid-April, according to the Bureau of Transport Economics and Statistics, Interstate Commerce Commission. The largest increase, 6.54 per cent, occurred in the maintenance of way and structures group.

Freight tonnage handled by Class I intercity truckers in the first quarter of this year was four per cent below the volume of the comparable 1951 period, according to the American Trucking Associations.

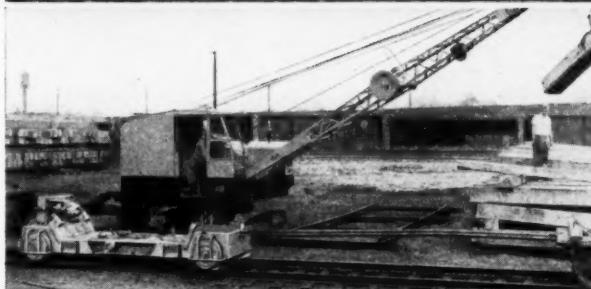
The six Class I railroads having the lowest casualty rates in their respective groups in 1951 were the Union Pacific, with a casualty rate of 3.40; the Pennsylvania (Altoona works), with a rate of 3.45; the Nashville Chattanooga & St. Louis (3.65); the Pennsylvania-Reading Seashore Lines (4.66); the Missouri-Illinois (1.68); and the Colorado & Wyoming (.99). These roads were group winners of the railroad employees' national safety award of the National Safety Council.

The gross capital expenditures of the Class I line-haul railways during the first three months of 1952 amounted to \$345.0 million as compared with \$282.2 million for the same period of 1951, an increase of 22.2 per cent. Of the total expenditure, 21.4 per cent went for road and 78.6 per cent for equipment.

Several notable railway property improvement projects have been completed during the past month. Among these, the Baltimore & Ohio placed in service on June 16 a new 3,300-ft. double-track tunnel near Clarksburg, W. Va., on its main line between the Atlantic Seaboard and Cincinnati and St. Louis. On June 18 the board of directors of the Milwaukee Road were taken on a tour of the company's modernized Air Line yard at Milwaukee, which has the first installation of retarder speed control. Out on the West coast the Southern Pacific placed in full operation its new classification yard of 49 tracks at Roseville, Cal.

ALSO WORTH NOTING—R. P. Hamilton, superintendent of safety of the Frisco, was elected chairman of the Safety Section, Association of American Railroads, at the groups' annual meeting at New York on June 5 . . . The 1952 property improvement program of the Wabash will involve an expenditure of about \$17 million, of which \$5 million will go for roadway improvements, and \$12 million for new equipment and improvements to existing equipment, according to an announcement made by Arthur K. Atkinson, president . . . Freight loss and damage reported by member lines of the Association of American Railroads for the year 1951 showed an increase of 12.5 per cent over that reported for 1950 . . . Hilmar B. Christianson, Jr., assistant engineer, Atchison, Topeka & Santa Fe, is among a group of "young industrial executives of unusual ability" who have been awarded Sloan fellowships for 12 months of study in industrial management and economics at the new School of Industrial Management of the Massachusetts Institute of Technology.

# MORE WORK CAPACITY



**Self-propelled RAILAID** works both on and off-track, travels at 4 rail speeds up to 14.4 m.p.h. Crane loads and unloads itself on ramp-equipped propulsion car in less than 10 min., lifts 6.6 tons on carrier, 8½ tons on ground, converts to clamshell, dragline, pile driver, ½ yd. shovel, box.



**Railroad MUD-JACK®** stabilizes track beds without interrupting traffic. Injection points are driven into water or ballast pockets in sub-grade, hydraulic pump forces slurry into weakened area, stabilizing existing material. Leaves firm, sub-grade... saves labor... reduces "slow orders".

## with KOEHRING HEAVY-DUTY

Working on or off flat car . . . around yards or along the line, the reserve strength and operating stability of Koehring heavy-duty 304 give a definite advantage in extra work capacity. With 13.9-ton lift on crawlers (25 tons on rubber) the 304 handles extra heavy loads, clamshell and dragline buckets on a wide work range . . . has ample power, stamina and weight-stability for toughest digging with ¾-yard dipper. Heavy-duty strength beyond its rated capacities protects all rush schedules and routine assignments against costly down-time.

With every 304 crane or excavator attachment, big Koehring booster clutch cuts normal lever pull over 50% . . . reduces operator fatigue, yet retains "feel" of load. Heat-compensator spring makes clutch tension changes automatically . . . keeps operator and machine producing at top efficiency at all times. For specific figures on 304 work capacity and complete information on its many heavy-duty mechanical features, write us. Other Koehring sizes lift up to 79½ tons . . . have dipper capacities to 2½ yards.



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COMPANY, Milwaukee 16, Wis.

you are interested in

## BALLAST CLEANING

we stand on  
our record



Just Ask the  
Railroads  
That have used us!

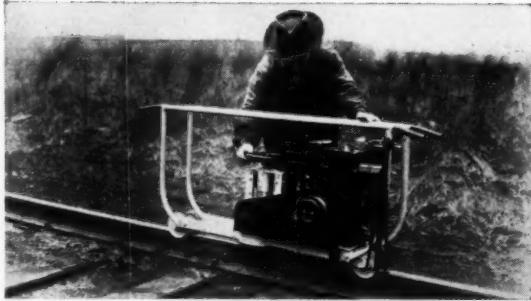


FRANK SPENO RAILROAD BALLAST  
CLEANING CO. INC.

306 North Cayuga Street Ithaca, New York

**Increases**

## RAIL GRINDING ACCURACY



## NEW P-45 PORTABLE RAIL SURFACE GRINDER

This new, one-man cup wheel machine grinds welded rail ends and removes mill tolerance and scale before heat treating. With a high degree of accuracy at a minimum of operator's skill and effort . . . gives a smooth, highly polished surface. Portability and light weight make it ideal for heavy traffic lines.

*Check these advantages!*

- ✓ 3½ H.P. air-cooled gasoline engine.
- ✓ Adjustable V-Belt Drive acts as overload release, preventing damage to other moving parts.
- ✓ Cup Wheel is adjustable to compensate for wear.
- ✓ Ball bearings and wearing parts are protected against dust and dirt.
- ✓ Rollers on carriage guide are adjustable—assure proper cutting angle of grinding wheel.
- ✓ Length, 58 inches — Width, 14½ inches — Height, 25½ inches — weight, 225 lbs.
- Write for more information on the P-45 and other fast, easy-to-operate track equipment.

**Railway Trackwork Co.**

3207 KENSINGTON AVE., PHILADELPHIA 34, PA.

Representing

Burro Cranes      Wayer Impactors  
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4382

# WINTER WORK for WEED CONTROL ACTION *Now!*



**Left:**—Nalco Weed Control Laboratory screening experiments provide ideal growth conditions for weeds and grasses . . . show new, better ways to provide complete weed control on your right-of-way.

**Below:**—Tropical outdoor grass and weed plots give Nalco Weed Control Chemicals severest tests under actual fast-growing conditions.



NEW weed and brush control chemicals are thoroughly proved in Nalco's year-around research and development program. Laboratory screening and test plot observations must demonstrate their effectiveness . . . before they are ready for your right-of-way.

Results of successful Nalco developments benefit railroads by achieving more thorough kill of all vegetation, marked delay in regrowth, and greater application safety . . . All, in the long run, leading to better vegetation control at less outlay of time and money.

Nalco spray cars are available for both brush and weed spraying on railroads using tank car lots of Nalco weed or brush control chemicals. Write for details today.

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Canadian inquiries should be addressed to  
Alchem Limited, Burlington, Ontario

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*halco*<sup>®</sup>

SYSTEM . . . Serving the Railroads through Practical Applied Science

**Men who depend  
on power...know  
they can depend  
on CUMMINS®**



**Every CUMMINS DIESEL is built not once but twice**



Railroads and industrial locomotive operators have learned to count on Cummins Diesels for dependable power day in, day out. What's behind this consistent reliability? One good reason is the fact that every Cummins Diesel is actually built *twice*. After initial assembly, and run-in testing, every engine is disassembled, inspected; then reassembled and tested again.

This extra care—together with Cummins' economy-proved fuel system and efficient parts and service organization—makes lightweight, high-speed (50-550 h.p.) Cummins Diesels a wise first choice for men who depend on power.

Whatever your power needs... whether it's for switching or loading, portable power units or generator sets... or any other important jobs... your Cummins dealer is the man to see.

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(R-63)



TRADEMARK REG. U. S. PAT. OFF.

**Leaders in lightweight, high-speed diesel power!**

# Township Thanks Railroad

The Fairport, Painesville & Eastern Railroad Company received the following letter from the Board of Trustees of Painesville Township, Ohio:

Gentlemen:

The attention of the Board of Trustees of Painesville Township has been called to the condition of the various railroad crossings in Painesville Township. Their inspection has resulted in a motion passed by the Painesville Township Trustees at their meeting Sept. 13, 1951, formally instructing the Clerk to write a letter to the officials of the Fairport, Painesville & Eastern Railroad, thanking them for their efforts to keep their crossings improved and in safe condition for traffic. Your cooperation merits the appreciation which this letter tries to convey to the officials and others responsible.

Respectfully yours,  
Philip W. Baker  
Clerk

## FOR KOPPERS PANEL CROSSINGS

The F. P. & E. R.R. Co. wrote us that " . . . all of the crossings referred to were supplied by Koppers. In March, 1948, we purchased our first Koppers Pressure-Creosoted Panel Grade Crossings and subsequently have purchased 15 more. All of these crossings are giving us excellent service. That they are equally satisfactory to the public agencies responsible for road conditions is indicated by the letter from the Township Trustees."

Koppers Creosoted Grade Crossings are made to last. The panel method of construction offers easy installation. Completely assembled individual panels are securely fastened to withstand vibration, swelling or shrinking of the wood. When the track is worked, the crossings may be removed and replaced, using all the original material.

Write for a copy of the new folder on KOPPERS GRADE CROSSINGS. It contains construction details and technical data on crossings that not only save money but also earn public applause for doing a good job.

KOPPERS COMPANY, INC. • Pittsburgh 19, Pa.

**KOPPERS PRESSURE-TREATED WOOD**



# Better Weed Control • HYKIL •

## TRACK TREATMENT PROGRAM

Best approach to weed control problems. The HYKIL track-treatment program offers an outstanding new concept of economical weed and brush control... proven by thousands of miles of superior performance.



The high-potency #6 concentrate of specially refined petroleum compounds gives non-poisonous, faster, longer-lasting kill. Immediately controls existing weeds and grass growth, penetrates and sterilizes exposed weed seeds, but will not affect adjacent vegetation. Adopted by major railroads as standard weed control material. Stocks available from Tulsa, Oklahoma, Portland, Oregon, and Los Angeles, California.

HYKIL "200" Spraycars are expressly designed...the latest in railroad weed killer application equipment. Operating at 10-15 mph, applying up to 1500 mixture gallons per mile, HYKIL cars give positive weed coverage of weeds and grasses at variable desired widths to 24 feet. Draws HYKIL Weed Oil and water from separate, attached tank cars, metering amounts and mixing within pump at exact moment of application. Treats 40-60 track miles daily.

## For positive results - Use the TWO!

HYKIL Weed Killer #6

HYKIL "200" Spraycars

Write for complete literature and information.

W. T. COX COMPANY  
1021 Fruit St., Santa Ana, Calif.  
1015 Walnut St. (Suite 300)  
Kansas City, Mo.

HYKIL

RAILROAD DIVISION

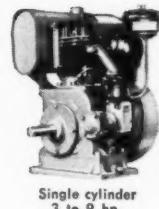


## Yes-WISCONSIN **HEAVY-DUTY** *Air-Cooled* ENGINES Never Stop Working on the Railroad!

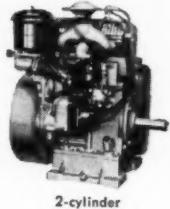
Operating both on off-track and on-track construction and maintenance projects, the chances are that you are currently using many pieces of Wisconsin-powered equipment. And a job-check with the men who use Wisconsin-powered machines would probably show surprising records in terms of H. P. Hours of On-the-Job Service without layups for servicing.

Leading manufacturers of railroad maintenance equipment such as Fairmount Railway Motors, Inc., Electric Tamper & Equipment Co., Woolery Machine Co., Kalamazoo Mfg. Co., The Kershaw Co., Northwestern Motor Car Co., and many others have been specifying Wisconsin Engines as original power equipment for many years. These manufacturers cannot afford to risk the service reputability of their equipment and their own good names to engines that fail to "measure up" in every respect.

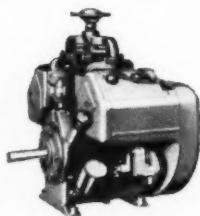
Specify "Wisconsin Air-Cooled Engines" for equipment that really goes to work on the railroad!



Single cylinder  
3 to 9 hp.



2-cylinder  
7 to 13 hp.



4-cylinder  
15 to 30 hp.



WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines

MILWAUKEE 46, WISCONSIN



## EMERGENCY SET-OFF BY ONE MAN

One man can quickly remove the Fairbanks-Morse Model 101 from the rails—even without a set-off.

Low lifting weight, balance, and guards between the wheels contribute to this vital safety advantage. Add features of immediate reverse, four-wheel brakes, grouped controls, full visibility—and you'll see why the

Model 101 Motor Car has won such wide acclaim on railroads for safety.

For all maintenance, inspection and signaling service, look to the complete line of Fairbanks-Morse cars. You'll find the answer to safe, reliable transportation.

Fairbanks, Morse & Co., Chicago 5, Illinois.



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*a name worth remembering when you want the best*

RAIL CARS • RAILROAD EQUIPMENT • PUMPS • SCALES • ELECTRICAL MACHINERY  
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## YOU CAN'T MATCH IT ANYWHERE!



Like a finger print, there is no matching a Viking Rotary Pump. There are a lot of pumps that look like Viking but none are built like Viking.

Insist on the genuine "gear-within-a-gear" Viking . . . the time-proved, dependable, quality-built pump that out-performs all substitutes.

Building for over 40 years the now most copied of all rotary pumps, assures you of receiving the pump that can't be matched anywhere.

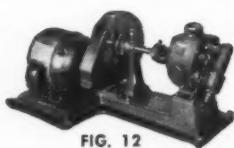


FIG. 12

For additional information, ask for bulletin 525Y today.



**Viking** PUMP COMPANY  
Cedar Falls, Iowa



# BARCO

**LOW FIRST COST!**

**LOW MAINTENANCE COST!**

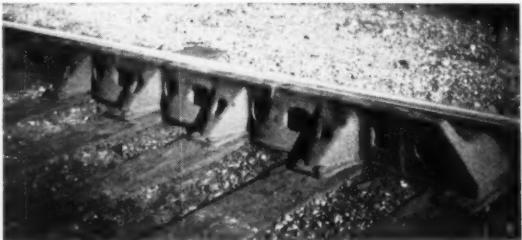
## TYTAMPER

YEARS of experience throughout the country have proved the superiority of BARCO UNIT "TYTAMPER" — It's still the **BEST!** Check these points:

- Heavy enough to go through cemented ballast — but still light and easy to handle.
- VERSATILE — excellent for work on cross-overs, interlocking switches, breaking ice or frozen cinders.
- No hose or auxiliary equipment. Low cost, economical. Let us give you the complete story.

**BARCO MANUFACTURING CO.**  
1805 Winnemac Ave. • Chicago 40, Illinois

## Use Q and C Manganese Guard Rails To Assure Safety and Economy



The design and rugged construction of The Q and C One-Piece Guard Rail assures strength, safety, durability and economy. They are easy to install and a minimum of maintenance is required, resulting in reduced costs.

Q and C Guard Rails are well braced to resist thrusts of the heaviest equipment and are made of full manganese steel for various rail sizes.

Specify Q and C Guard Rails on your requisitions.

### THE Q AND C CO.

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Use this section when seeking a new man, new position, or when buying or selling secondhand equipment.

#### CLASSIFIED ADVERTISEMENTS

\$10.00 an inch, one inch deep by three inches wide, an insertion.

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Railway Engineering and Maintenance  
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#### WANTED—NEW

Company with national distribution, sales, and service coverage wants one or more additional items applicable to Diesel locomotives or freight cars. Our Railroad Department can readily exploit new items through established contacts.  
REPLY: BOX NO. 752

#### RAILWAY ENGINEERING AND MAINTENANCE

79 West Monroe Street  
Chicago 3, Illinois

# Raising the Roadbed

**HIGH AND DRY RIGHT-OF-WAY.** Banking and grading nearing completion, International's TD-6 levels the new flood-free roadbed.



## *International power helps flood control along the Des Moines and Central Iowa Ry.*

Raising the right-of-way above the flood stage of the Des Moines River is one of the methods of flood control being used by the Des Moines and Central Iowa Ry.

Their International TD-6, pictured here, is raising the tracks  $7\frac{1}{2}$  feet above any recorded flood level to assure steady freight service to numerous industries located along the line.

Raising roadbeds means moving mounds

of dirt and clay along the right-of-way. And the TD-6 moves it the right way—faster, easier and at lower cost.

Whether controlling rising rivers or rising maintenance costs is your problem, you'll find International "Power that Pays" does the job well! See your International Industrial Distributor today.

INTERNATIONAL HARVESTER COMPANY  
CHICAGO 1, ILLINOIS

**POWER THAT PAYS**



**INTERNATIONAL**

# Lengthen the Life of Your Bridge Ties



**KOPPERS TIE-SEALING COMPOUND** protects these bridge ties against premature failure caused by splitting, checking or cracking. Covering of fine stone is an armor against fire.

## with KOPPERS TIE-SEALING COMPOUND

• Railroad ties take a beating, particularly bridge ties. And they are expensive to replace. That's why, at the first sign of splits, checks or cracks, Koppers Tie-Sealing Compound should be applied.

This specially-processed coal-tar coating *fills in and seals up* openings . . . retards their spread . . . protects ties against decay . . . reduces fire hazard . . . increases service life by an estimated 5 to 10 years.



Use Koppers Tie-Sealing Compound on your railroad system. Details and price information on request.

**KOPPERS COMPANY, INC., Tar Products Division, Pittsburgh 19, Pa.**

## NEW TRACK JACK Offers 3 Big Advantages

HIGHER LIFT—Full 6" gives extra margin

TRIPS from left or right Improved safety thumb guard

LOWER TOE—1½"—No removing of ballast

Provides the highest lift (6") of any surfacing jack! Big forged (not welded) and machined toe has minimum height of 1½"—gets under rail without removing ballast; requires less digging in under-tie work. Tripping from either right or left side and improved thumb guard gives new convenience and safety.



**NEW  
SIMPLEX 16A  
TRACK JACK**  
15-ton capacity.  
Weight, 45 lbs.  
Fast, easy operation.  
Sets firmly, stands straight.  
Tested for full capacity on toe.

**Simplex**  
LEVER • SCREW • HYDRAULIC  
Jacks

**TEMPLETON, KENLY & CO.**

1026 South Central Avenue

Chicago 44, Illinois

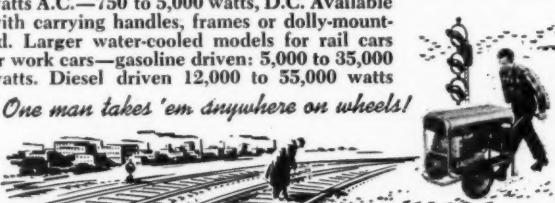
## Cut Costs, Speed Work on Construction and Maintenance Jobs!



5 KW D.C. model with carrying frame.

Take an Onan portable electric plant to every right-of-way maintenance of construction job! It will supply quick "plug-in" electric power for cost-cutting, fast working electric tools—drills, saws, nut runners, grinders, pipe threaders or any motor-driven equipment. Lightweight models from 400 to 3,000 watts A.C.—750 to 5,000 watts, D.C. Available with carrying handles, frames or dolly-mounted. Larger water-cooled models for rail cars or work cars—gasoline driven: 5,000 to 35,000 watts. Diesel driven 12,000 to 55,000 watts.

One man takes 'em anywhere on wheels!



Write for folder showing complete range of A.C. and D.C. models.

**D. W. ONAN & SONS INC.**

4584 University Ave. • Minneapolis 14, Minn.

**DON'T LET ANOTHER SEASON GO BY**

**WITHOUT LEARNING  
AT FIRST HAND  
HOW MUCH  
YOU CAN SAVE  
and ACCOMPLISH  
with a**

**JACKSON  
MULTIPLE.**

**TRY ONE ON YOUR OWN TRACK**

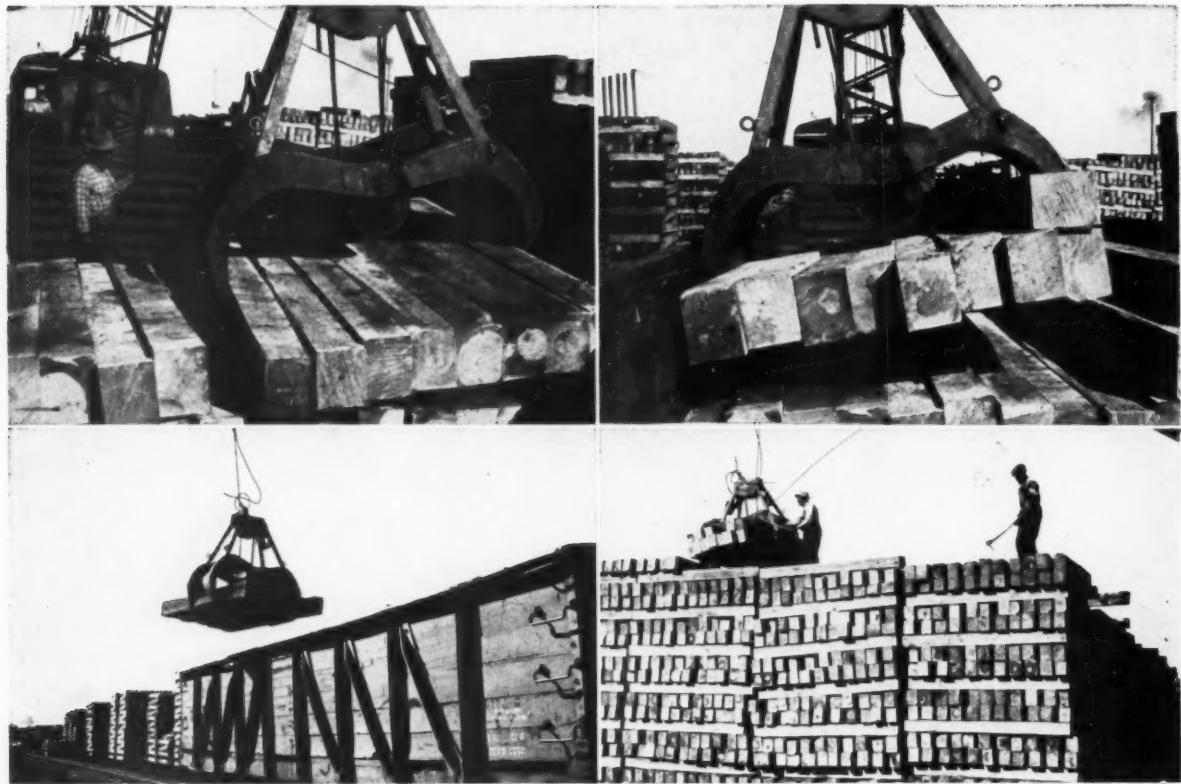
You don't have to buy it. We will be glad to place one on your track on a ~~safe~~ and equitable basis. And the reason we are so inclined is because we are confident that when you observe it in operation, see the high quality of track it produces, regardless of lift or type of ballast used, and note the speed with which it does it, you will be convinced that there is nothing to equal it, and that it is much cheaper to own a JACKSON MULTIPLE than to do without it. For savings that still may be made this season, and for larger savings in the years to come, go in touch with us NOW!

Due to its three sets of quickly interchangeable blades (each designed for a specific set of conditions) the JACKSON MULTIPLE operates at peak efficiency in all ballasts and all lifts. No other on-track tamper is as universally efficient or versatile.



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VIBRATORS  
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LUDINGTON, MICH.

**SOLD IN U. S. A. BY**  
**ELECTRIC TAMPER**  
**& EQUIPMENT CO.**  
LUDINGTON, MICHIGAN



Handling ties with a "Quality First" MACK Grapple

Made in 4 Standard Sizes or Special to Customers Order

Any crane equipped to handle a clam shell bucket will handle a MACK Grapple.

For full particulars write MACK WELDING CO.—9206 Grand Ave. Place, Duluth 8, Minnesota

*Lewis* **sealtite**

**hook bolt**

A highly dependable, superior bolt used in bridge and trestle construction. Forged from S.A.E. 1045 steel. Patented fins prevent turning. Sealtite washer nut adds strength, stops seepage. Available in Hot-Dip Galvanized finish for greater durability and economy.

Used by 85% of America's Class I Railroads.

See your Lewis representative, or contact factory for samples, prices, full details.

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## WHO'S WHO IN RAILROADING

Engineering officers will want a copy of the Twelfth Edition of WHO'S WHO in RAILROADING. Here they will find complete and helpful biographical information on the key men in the railway industry. More than 6,000 of these men are in the edition, 2,000 for the first time.

Send for a copy on  
TEN DAYS' APPROVAL

and see for yourself how much important information it contains about the men you do business with.

1949, 827 pages, 6 x 9, \$10.00

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# 1931-1952...MODERN BALLAST CONDITIONING

*Proven*

Over 21 Years



*Complete*

**Ballast Conditioning  
Trains Entirely  
Self-Contained on  
Our Own Standard  
Railroad Equipment**

R.B.C.C. five-unit trains do a thorough ballast conditioning job on *both* sides of the track in one pass, two center ditches, two shoulders, or one of each.

R.B.C.C. three-unit self-propelled trains (photo above) do a thorough ballast conditioning job on *one side* of the track *in one pass*; one center ditch, or one shoulder.

No other equipment for outfit cars or dirt handling need be furnished by the Railroad. No railroad cars are tied up, as our equipment with complete facilities stores and disposes of all dirt removed from fouled ballast. Each train contains a complete maintenance shop and store room.

One track only is occupied by these trains to do a thorough job of ballast cleaning, complete excavating, and dirt disposal. Adjoining tracks can be cleared *in one minute* when necessary.



BEFORE



AFTER



BEFORE



AFTER

**RAILWAY  
BALLAST  
CONDITIONING  
CORPORATION**

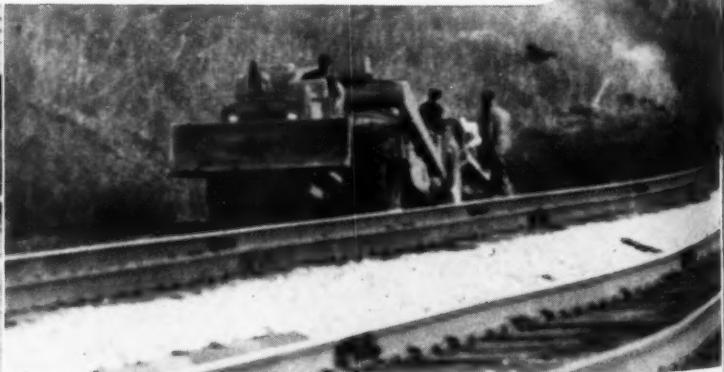
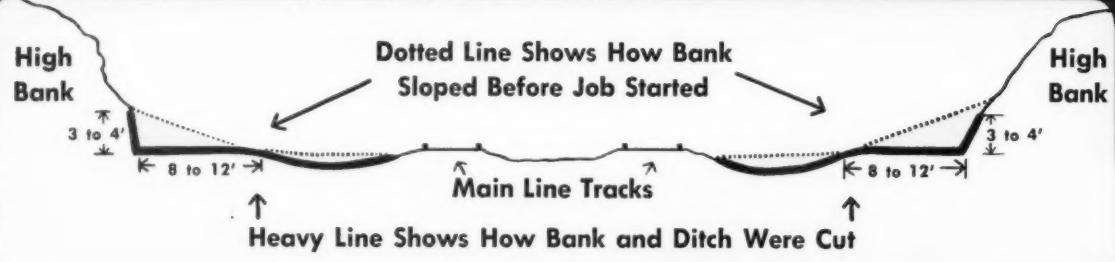
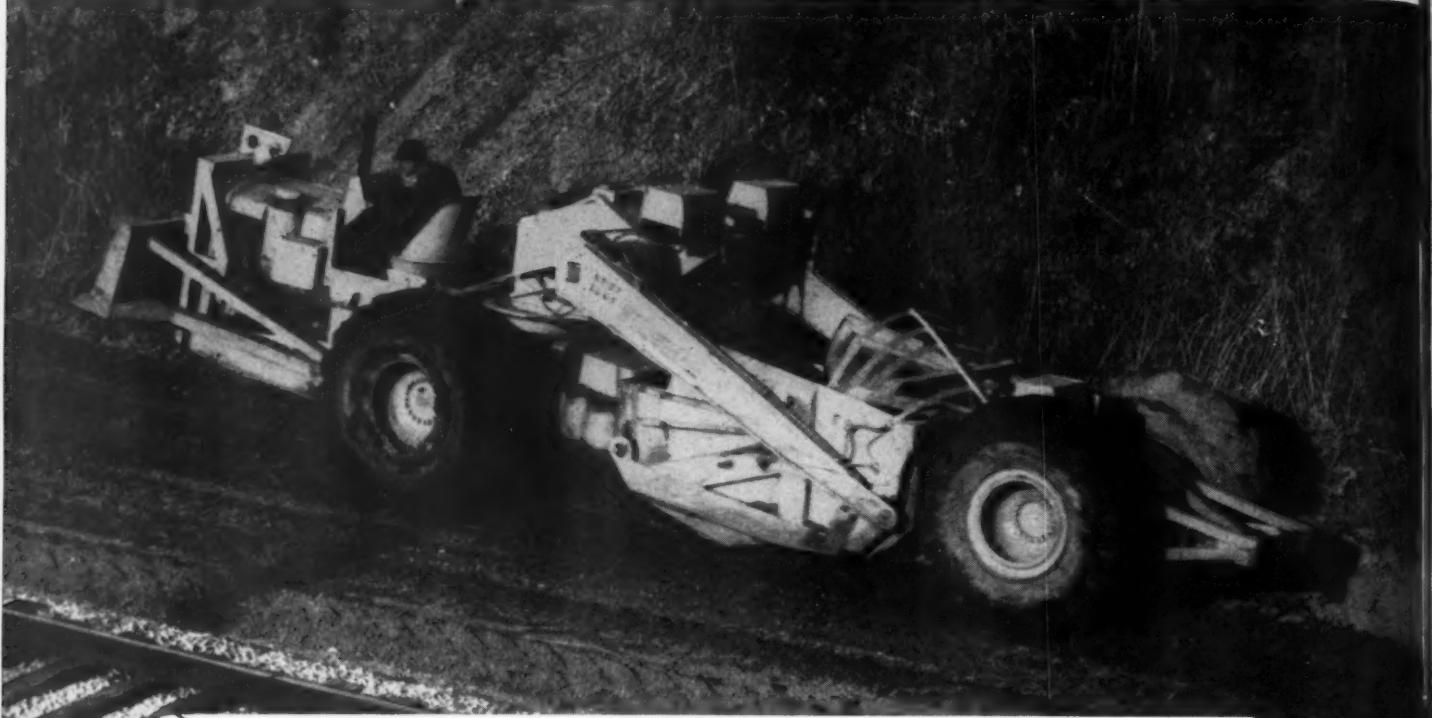
RAND TOWER, MINNEAPOLIS, MINNESOTA • METROPOLITAN BANK BLDG., WASHINGTON, D.C.

*Picture Proof* of thorough ballast conditioning.  
Unretouched photos of actual contract service show  
before and after cleaning with our equipment.

R.B.C.C. ballast cleaning and excavating  
service, complete with personnel and equip-  
ment, is handled on contract basis.



# "Best production tool



**Tournapull takes shortest route** between jobs at fast 28 m.p.h. clip. Travels via highway or down right-of-way . . . goes right to work with no unloading delays. This greatly simplifies dispatching . . . speeds emergency service anywhere in the Division. In winter, "D" mounts V-type Snow Plow to open yards, sidings, loading tracks, access roads.

**Fast moves from track** are easily made at the approach of traffic. In less than a minute after line is clear, "D" can be back on the job digging, cleaning ditches, spreading ballast, widening embankments, relocating grades. Low-pressure 18.00 x 25 tires flex over rails without damage to machine, tires, ties or track.

LETOURNEAU  
**LET**

**R. G. LeTourneau, Inc.**

# we have . . . "

## reports Job Superintendent on main line ditching for large western, Class 1 railroad

Versatile D Tournapull continues to receive enthusiastic praise from rail officials in charge of right-of-way maintenance. One large western, Class 1 railroad recently put their rubber-tired D Tournapull railroad "handyman" to work maintaining banks and opening up drainage ditches along main line tracks. After a full season's operation, "D's" excellent performance drew praise from the job superintendent who reported, "Tournapull is the best production tool we have. It really moves yardage, especially on long hauls."

### Excavates... hauls... spreads

In speeding the improvement program, the "D" demonstrated its unusual ability to work under difficult conditions. Material excavated was generally wet, sticky, soft clay and gumbo. Work area was very confining, requiring short, tight turns every load. Round trip hauls from cut to wasting areas averaged 700' at this particular location. In several instances, "D" had to haul 75' up a 25% grade . . . dump on the run, then return down the steep grade. Despite these adverse conditions, Tournapull was 100% efficient in over 900 hours of operation . . . easily handled bank and ditching assignments, plus day-lighting road crossings along 50 miles of right-of-way — all in one season!

Tournapull's mobility and speed are important factors in simplifying maintenance scheduling. One man and Tournapull can be on a job 28 miles away in an hour. Units take most direct route . . . via highway, down or across tracks . . . work alone, or push-load each other in pairs. Their work capacity and operating flexibility improve maintenance, eliminate delays in rail traffic, high cost of work train services, and headaches of dispatching and supervision. Getting work done faster, easier, with less manpower is a habit with Tournapulls. Write for the name of the LeTourneau Distributor serving your Division. He has more to tell you about these modern "handymen".

*Send now to: R. G. LeTOURNEAU, Inc., Peoria, Illinois*

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**Working in confined areas** is made easy by "D's" ability to turn 90° left or right. Steering and scraper operations are controlled from electric dashboard switches. This simplifies training . . . improves safety. Big 4-wheel, disc-type air brakes (2,822 square inches, total braking surface) are also important safety-first assets for tight quarters.



**Wasting at fill**, "D" often had to climb 25% grades . . . drive through wet, spongy clay, then spread its load on the run. Big tire electric power steer, plus Tournamatic differential, enabled Tournapull to make fast get away and return to track-level ditch. Optional electrically-controlled dozer blade does odd job emergency dozing.



**Big 9-ton, 7-yard capacity** bowl is unloaded in seconds . . . load can be spread in even layers 1" to 26½" thick or piled in one place. Electric-control tailgate cleans bowl thoroughly for capacity load next trip. Large square top opening allows fast, easy loading of ballast or other material from hopper, clamshell or shovel.

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TOURNAPULLS  
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 27½-yd. "A"

TOURNADOZERS  
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152-35

\*Reg. Trade-mark

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# ADDITIONAL INFORMATION

*On Any of the Products Mentioned in This Issue*

Below is a complete index of the products referred to in both the editorial and advertising pages of this issue. If you desire additional information on any of them, use one of the accompanying addressed and stamped postcards in requesting it. In each case give name of product and page number. The information will come to you directly from the manufacturer involved, without any obligation on your part.

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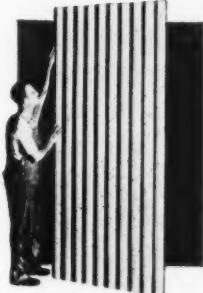
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*Monotube Foundation Piles*



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*Built with*

**asbestos-cement CORRUGATED TRANSITE<sup>\*</sup>**  
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# STRUCTURAL STEEL B

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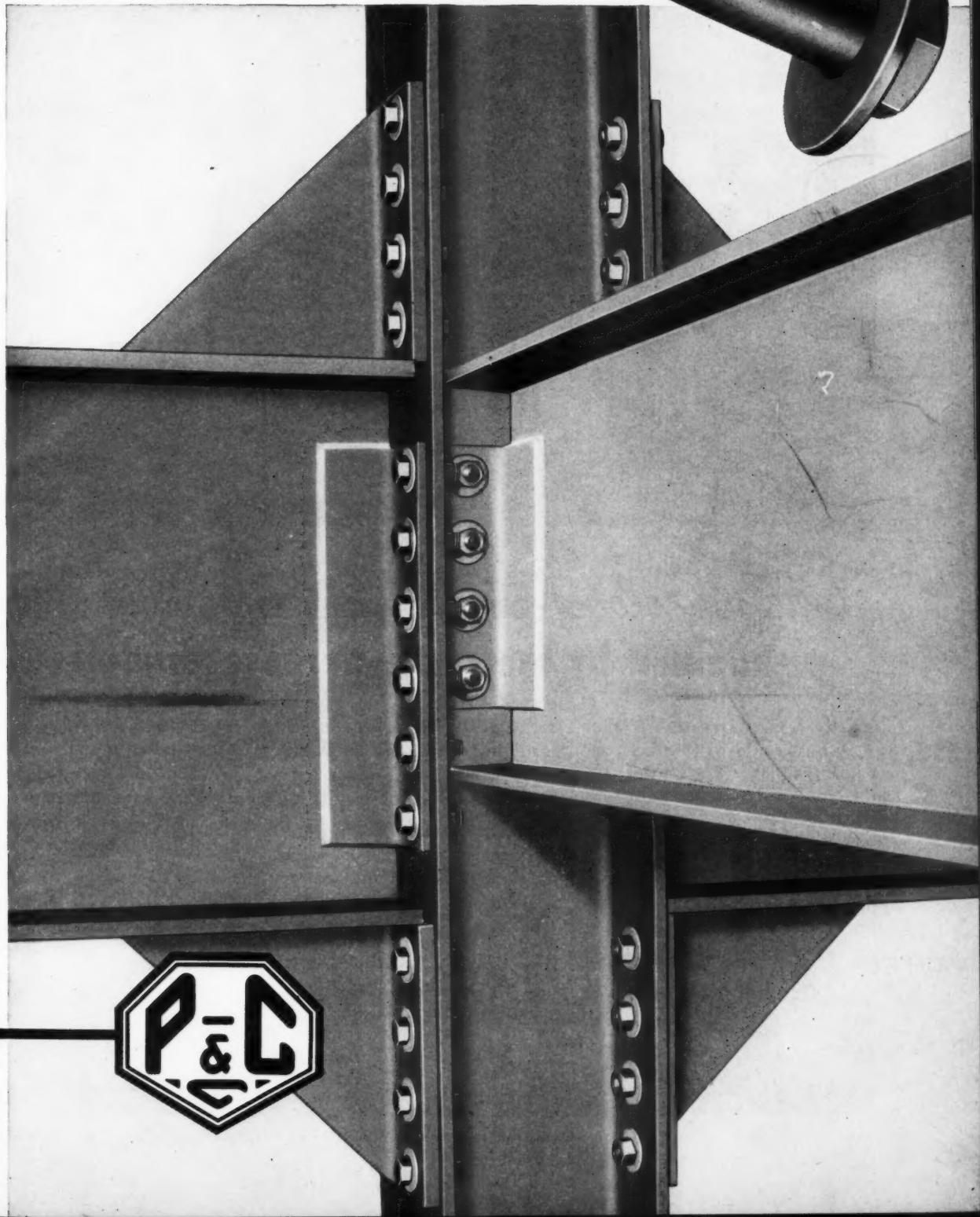
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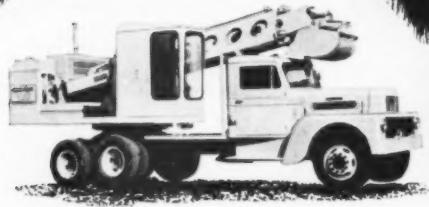
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*Dressing slopes—one of many maintenance jobs  
handled by the multi-purpose Gradall*

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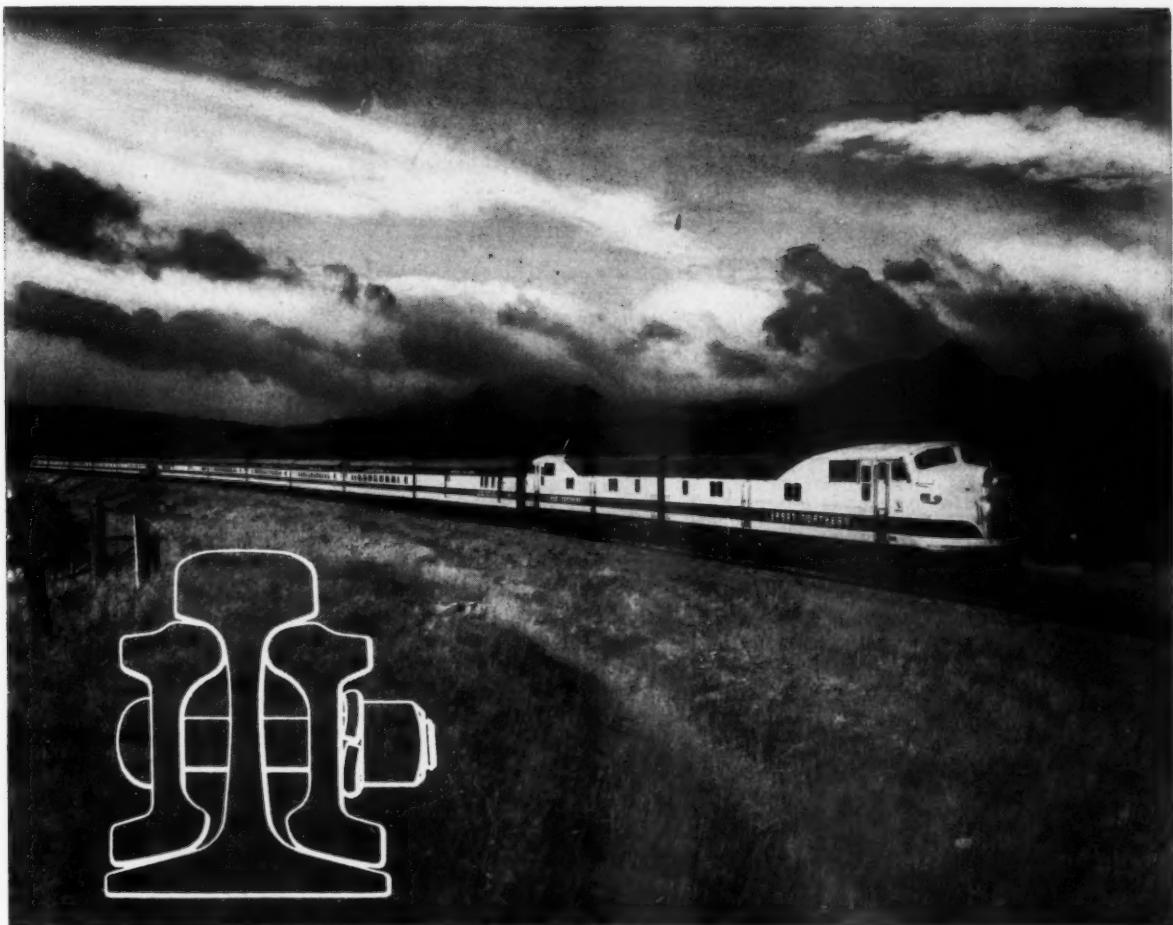
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**IN RAIL JOINTS...**

*Less* MAINTENANCE  
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**THE RAIL JOINT COMPANY Inc.**  
50 CHURCH ST. NEW YORK 7, N. Y.

No. 233 of a series

# Railway Engineering and Maintenance

SIMMONS-BOARDMAN PUBLISHING CORPORATION

79 W. MONROE STREET  
CHICAGO 3, ILL.

Subject: Our Foreign Circulation

July 1, 1952

Dear Readers:

I thought you might be interested in having some idea of the extent to which railroad men in foreign countries are interested in the standards, methods and equipment that you have helped to develop and are using for the maintenance of railroad properties in this country. I know of no better yardstick for measuring this interest than the extent of the foreign circulation of Railway Engineering and Maintenance. When a man in, say, Japan pays \$7 a year to subscribe to a magazine printed in a foreign language he is certainly displaying a keen interest in learning how his contemporaries in the country where the magazine is published are solving the same problems he encounters in his daily work.

While I was aware that Maintenance has always had a substantial list of foreign subscribers I was frankly surprised to learn, on checking recently with the circulation department, that we have a total of more than 400 paid subscriptions going to foreign countries exclusive of Canada. These subscribers are located in 54 countries, colonies or protectorates, not including any of the possessions of the United States. What this means is that our magazine is read in every large foreign country and most of the smaller ones, including such little known or out-of-the-way places as Tasmania, El Salvador and Nyasaland.

You may be surprised, as I was, to learn that the foreign country with the largest number of individual subscribers is India. Next, and about on a par with each other as regards the number of subscribers, we find Brazil, England, Japan and Australia. Other countries with considerable numbers of subscribers include Chile, Argentina, Germany, Belgium, Denmark, and Mexico.

An interesting fact is that the foreign subscriber is more prone to use the return postcards that are provided in each issue of the magazine for the convenience of those who wish to obtain more information regarding advertised products. What I mean by this is that the number of postcards returned by foreign subscribers is far out of proportion to those sent in by subscribers in this country. In all probability this phenomenon can be at least partly explained by the fact that for the foreign reader the return postcard is the only means available for getting the additional information desired, whereas the reader in this country can frequently pick up his telephone and call the local representative of the company making the product in which he is interested.

It must be gratifying to you to learn that railroad men abroad are so interested in learning how you do things. From the viewpoint of the editors the most gratifying aspect of this foreign circulation is that it has occurred spontaneously, that is, without any effort or solicitation whatever on the part of our circulation department. Finally, it is certain to be of significance and value to those of our advertisers who desire to cultivate markets for their products in foreign countries.

Yours sincerely,

*Merwin H. Dick*  
Editor

MHD:lw

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*deserves your consideration because.*

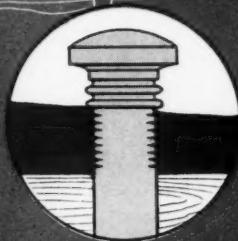
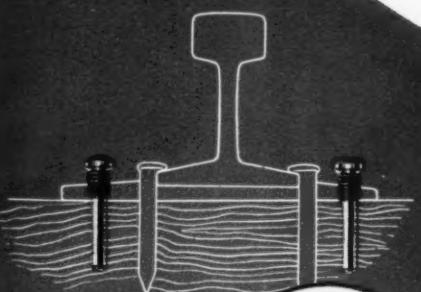
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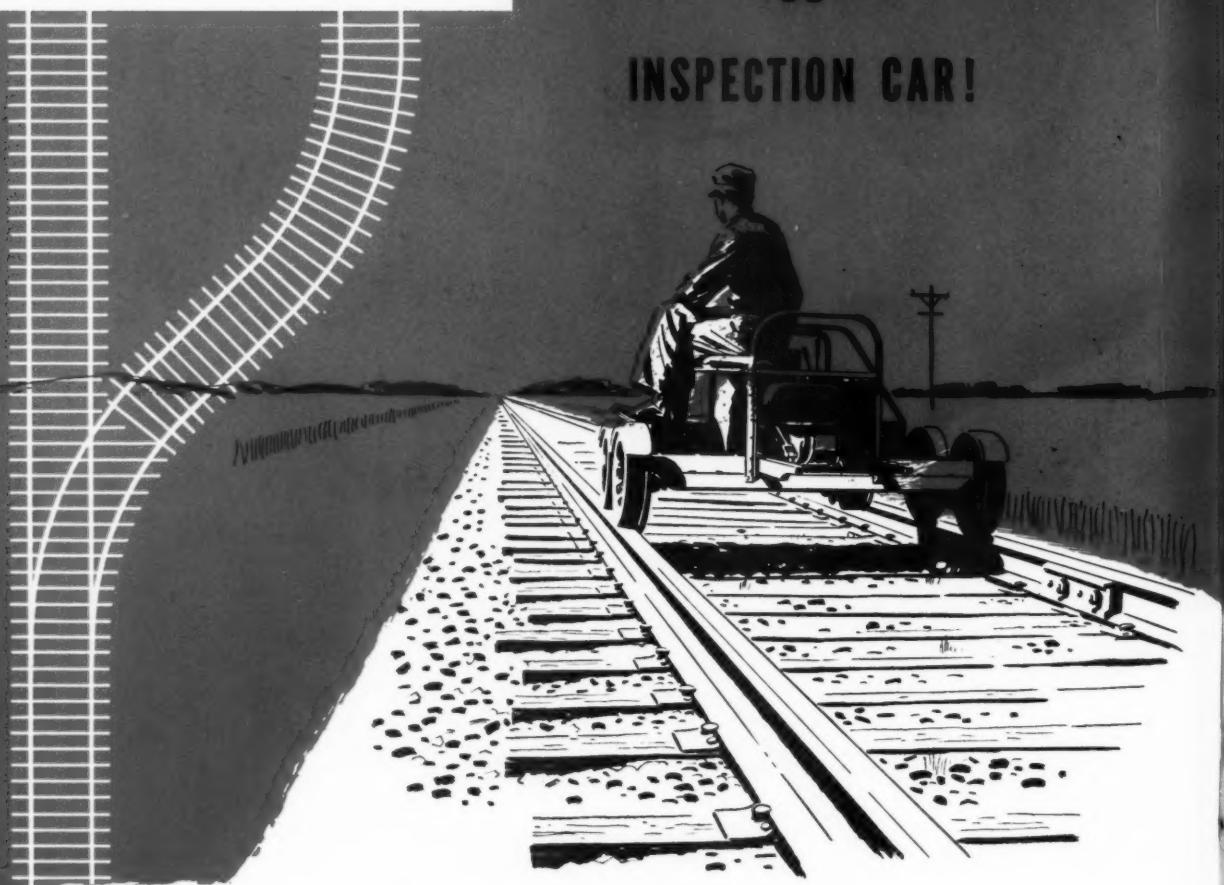
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AND WORK EQUIPMENT

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**INSPECTION CAR!**



The MR19 Series A Inspection Car, pictured above, is a dramatic example of Fairmont's success in building to the motto "Performance on the Job Counts." One of its most unique and useful features, as far as actual operation is concerned, is its two-way drive that permits the car to be driven in either direction without reversing the engine. And with two speeds in both directions, this MR19 Inspection Car provides unusual maneuverability

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ON THE JOB  
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JULY, 1952

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## Budget Dilemma —

### Making M/W Allotments Go Around

Even though the peak of activity has already been attained in carrying out this year's work programs, many maintenance men are beginning to think in a tentative way of the amount and character of the work they would like to get done in 1953. Doubtless, much of this thinking is haunted by the knowledge that, when the usual budget proposals are made to management later in the year, many of the items, including some of the more important ones, will be lopped off by the higher-ups before the budget is finally approved.

This procedure happens year after year on many roads, and maintenance officers as a whole are usually resigned to the fact that some of the projects that are rated as "must" in their minds will be missing from the final budget. It is not infrequent for some of these "must" projects to be deleted from the budget for several consecutive years before they are finally allowed to remain. Since it is to be assumed that a maintenance officer would not include any items in his budget recommendations that he does not consider essential to the safe and economical operation of the property, it is obviously an unhealthy situation to have any of them postponed for any length of time. What can be done to alleviate the impact of this situation on the peace of mind of maintenance men and on the condition of the properties under their jurisdiction?

The responsibilities of management are manifold, among them being the obligation to operate the property in such manner as to maintain a satisfactory relationship between revenues and expenses. In maintaining this relationship, management, perhaps more frequently than otherwise, finds it necessary to think of the maintenance budget in terms of dollars rather than units of work. This explains the tendency to take what appears to be a ruthless attitude toward budget proposals submitted by the maintenance department.

On the other hand, with the physical condition of the tracks and structures uppermost in mind, the maintenance officer must necessarily base his recommendations on the units of work (number of ties, tons of rails, etc.) required to keep the property in a satisfactory condition. Having decided on the amount of work that should be done, he figures out how much it will cost. All too often the cost is more than management feels the road is capable of bearing.

Every maintenance man knows that the only practicable way to deal with this problem is to make the available dollars go as far as possible. This can mean getting more output per man-hour through mechanization or other means, or it can mean the adoption of other methods of "stretching" dollars, such as the use of more efficient or durable materials.

Doubtless there is hardly a maintenance man who is not satisfied in his own mind that he is already wholeheartedly striving for these objectives. Certainly a great deal of progress has been made. But the potentialities have by no means been exhausted. Perhaps progress could be hurried somewhat if it were kept clearly in mind that improved practices introduced now or in the next few months will help to make *next year's* maintenance appropriations come that much closer to meeting the needs of the property.

**FIRE PROTECTION —****Needed More Now Than Ever**

DESPITE the great strides that have been made in protecting railway properties, fire losses suffered by American and Canadian roads during 1951 totalled \$12,916,999—the highest of record—according to the Fire Protection & Insurance Section of the Association of American Railroads. These losses were 32 per cent greater than those sustained in 1950 which had, in turn, increased 12 per cent over 1949 losses. However, some solace may be obtained from the fact that the number of fires decreased 3½ per cent.

More than 37 per cent of the total losses occurred to buildings of all types, making them, priced at \$4,842,739, the choicest entree on the 1951 fire menu. In contrast, bridges and trestles suffered only 171 fires that resulted in losses of \$582,144, or about half of the previous year's losses which were higher than usual.

These statistics present vivid reminders that fire-prevention work can never be relaxed—that more and better ways of protecting railway properties from fire must be sought continually. They also imply, rather forcefully, that fire hazards on railways must be increasing faster than fire protection is being applied, or losses would not be continuing at such high levels.

Maintenance officers are aware of the protective methods they have applied on their own properties and have evaluated the effectiveness of the results. Many of them have gone "all out" in the use of fire-resistive materials in buildings, in the application of fire-retardant coatings to bridge decks and the use of modern fire-fighting techniques. Other officers have been adamant. They have continued to wait for the effectiveness of new products and new methods to be proved at the other fellow's expense. Could it be that these "doubting Thomases," by failing to take advantage of every opportunity to provide fire protection to their properties, are, in effect, reporting the fires that caused the total losses to mount to new highs?

One of the major fields in which there is evidence that fire protection is not always receiving the attention it warrants is in the handling of diesel fuel oil. Ever since diesels became well established on the railways, an argument has been in progress as to whether or not diesel fuel oil is a volatile flammable liquid. Some say it can't be because its flash point is above 70 deg. F. and therefore it is not hazardous. Others point out that such an argument "splits hairs" and does not recognize the practical aspects of the case. They point out that, even though fuel oil may not be considered volatile, a lighted cigarette discarded into a pool of it lying under a diesel locomotive can cause an expensive

fire. Why take such a chance on a technicality? There is growing evidence that, until the "safe course" is pursued universally and technicalities forgotten, fire losses will continue to reach new highs year after year. Means of stopping this trend are available in the form of fire-retardant materials, fire-extinguishing agents and methods, and well-trained employees. Why not use them?

**EXTRA GANGS —****Output Is Assured by Spare Machines**

MUCH has been said about the need for carefully planning railroad maintenance work and establishing schedules in advance so as to obtain maximum utilization of mechanized equipment. There is no disputing these recommended practices because they do effect substantial economies. On the other hand, how much thought has been given to the possibility of improving extra-gang output by acquiring machines that can be expected to be idle much of the time? There is a perfectly logical reason for following such a seemingly contradictory practice, particularly with reference to large rail-laying and ballasting gangs.

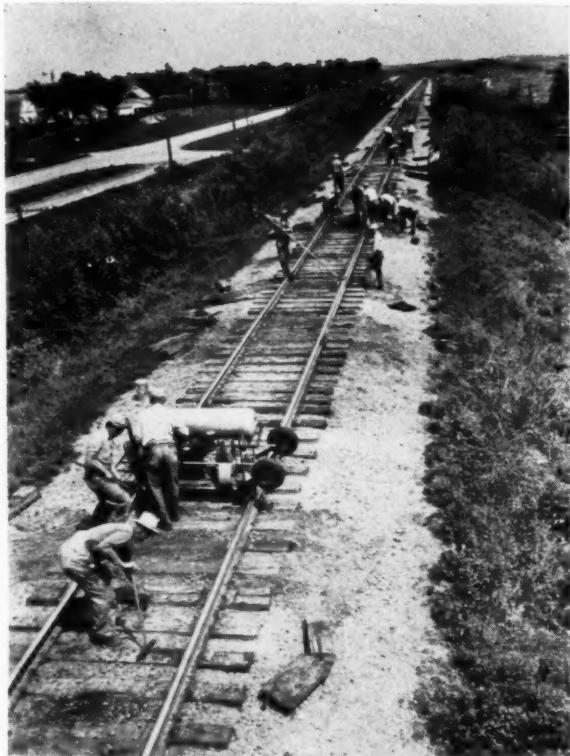
One midwestern railroad, which uses from 90 to 140 men in each of its rail-laying gangs and up to 300 men in its ballasting gangs, has found that the practice of providing spare equipment for its gangs is a form of insurance against a slowing down of the work due to machine failures. The road reasons that the machines employed with these gangs do the work of many men and do it more uniformly. Its gangs are organized around these machines on the basis that they will perform effectively and continuously throughout the day. If a machine fails, the output of the gang will be slowed, or even halted altogether, until repairs are made.

Because its gangs are well mechanized, the road mentioned above employs a mechanic with each large gang, whose duty it is to see that the equipment is kept in good operating condition. In the past, in the event of a minor breakdown, the mechanic would endeavor to repair the machine while it maintained its position in the gang. But while he was working on it, the progress of the gang from that unit back to the rear would necessarily be impeded. Even after the machine had been restored to service, there would be a delay before full production was once more attained.

Because such delays due to machine failures can be expensive this road has found it more economical to provide spare machines that can be thrown into the breach, so that the gang is able to operate at full efficiency while the mechanic repairs the failed machine as he finds the time to do it. The spare equipment is generally limited to the smaller machines.

The economies involved in providing spare machines for the use of extra gangs are worth investigating. It would seem that the cost of the reserve units could very easily be justified in view of the loss of productive time that might otherwise be incurred by machine failures.





THE 20-MAN district maintenance gang on the Great Northern is shown here spread out over a quarter of a mile. The two tie cutters are in the distance, followed by the eight men installing the new ties, two men inserting the tie plates, and the spike-driving machine (foreground). The man in the immediate foreground is reapplying removed rail anchors. Not shown are two men with a push cart who pick up pieces of the cut ties



A SPECIAL TOOL, called a "spoon bar," is used to pry the ballast away from the sides of the ties that are to be renewed in order that saw blades will not be damaged by the stones



WHILE the tie cutters are set off the track in order that rail traffic might pass, the operators sharpen the saw teeth on the grinders which are mounted on the tie-cutting machines

## Machines Make Tie Renewals Easier

**Great Northern effects substantial economies in renewing ties by equipping a small district maintenance gang with special tools and machines that simplify the operation. Machines are light enough to be removed quickly from the track to allow rail traffic to pass.**

• The general rule of tie renewals being made at the rate of a tie per man-hour has been badly shattered on the Great Northern. For a number of years this road has been making tie renewals at the average rate of 10 ties per man-day by using small district maintenance gangs, each consisting of about 20 men and a foreman and equipped with two tie cutters. This year, the road is experimenting with one of these gangs equipped with some special tools and newly-developed machines that have already proved

their worth in helping to enhance the production rate.

Tie renewals are not heavy on the Great Northern this year. For several years the renewals have followed approximately the same percentage as the average of 3 to 4 per cent for all railroads in the United States, but, for 1952, the renewal rate is only 2.36 per cent for the system. It is the practice on this road to make tie renewals on about one-half of the mileage in one year and on the other half in the following year so that as little of the road-

bed as possible will be disturbed in any one year by the tie renewal operation.

### Gang Uses Four Machines

For the purpose of trying out the new equipment, it was decided to place it in the hands of the district maintenance gang working on the single-track line between Minneapolis, Minn., and Willmar, where the renewals are averaging about 180 ties per mile. The equipment of this gang consists of two tie cutters, a tie-end remover, a spiking machine, a push car, and various small tools. The tie cutters need no description as these machines have been used for many years for cutting ties adjacent to the tie plates inside of each rail. The tie-end remover\* is a companion unit for the

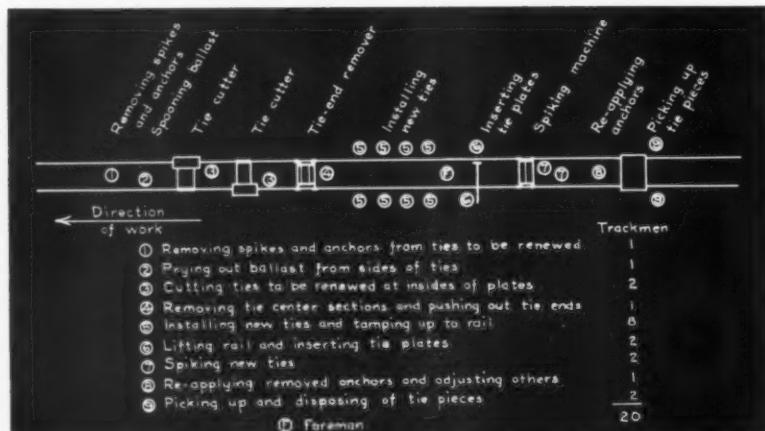
\* A detailed description of this machine appeared in the December 1951 issue of *Railway Engineering and Maintenance*, page 1134.



AFTER A TIE has been sawed into three sections by the tie-cutting machine, the operator of the tie-end remover first pulls out the center section of the cut tie and places it alongside the track where it is later picked up for disposal



AFTER THE CENTER section of the cut tie has been removed, the operator lowers the hydraulic cylinder of the tie-end remover down into the tie bed. When power is applied to the cylinder, the tie ends, complete with plates, are pushed outward



ORGANIZATION CHART showing the composition of the 20-man district maintenance gang while engaged in making tie renewals on the Great Northern. If the gang were working on track where flagging was required, two more men would be added

tie cutter; after the center section of the cut tie has been removed, the remover pushes the two end pieces outward through the ballast shoulders. The spiking machine is a new development and is described in the Products of Manufacturers Section of this issue, page 694. Its use on the Great Northern is its first application on any railroad.

In addition to the conventional small tools, such as claw bars, picks, track shovels, tie tongs, and mauls, this gang is also supplied with two special hand tools, namely, a spoon bar and a rail-lifting device. The

spoon bar is used to remove the ballast from a portion of each side of the tie where the tie-cutter saws are to work, while the rail-lifting device is used to raise the rail just high enough to permit a tie plate to be inserted after the new tie has been tamped up close to the rail.

#### How Renewals Are Made

Before the arrival of the district maintenance gang, the ties previously marked for renewal by the section foreman are checked by the district roadmaster, and the required number of new ties un-

loaded and distributed. The new ties are unloaded from a work train in accordance with the marks made during the inspection, as close to their points of application as possible, so that no redistribution is required.

In the first work operation a man, equipped with a claw bar and spike maul, pulls all spikes from the ties marked for renewal and removes any rail anchors engaging these ties. He is followed by another man, equipped with a pick and a spoon-bar, who pries out the ballast from each side of the ties where they are to be sawed, so that the saw blades will not be damaged by stones. The two tie-cutting machines, each in the hands of an operator, cut the ties near the inside ends of the tie plates. Each machine carries two dozen spare blades. The machines are also each equipped with a small grinder, powered by the same engine that drives the saw. During the periods when the machines are set off for the passage of trains, the operators grind the used saw blades and re-set the teeth whenever needed.

These machines are followed by the tie-end remover. A pair of tie tongs is carried on this machine so that the operator can lift out the center sections of the cut ties as he comes to them. The operator then spots his machine over the old tie space, lowers the hydraulic cylinder of the machine into the tie bed,



THE RAIL-LIFTING device, which consists of a long-handled steel rail-head grip and a fulcrum shoe, is used to raise the rail just high enough to permit the tie plates to be inserted on the new ties which have been tamped close to the base of the rail



MOUNTED on roller bearings, the new spike driving machine can be easily propelled by one man pushing on the handle. When the handle is released, brakes are automatically set on two of the wheels which keep the machine from "drifting"

and throws the control valve lever for pushing out the tie ends, together with their tie plates, through the ballast shoulders.

Behind this machine, eight men, working in teams of two, throw out the old tie ends, clean out any loose ballast that may have fallen into the beds, prepare the beds for the new ties, and insert and tamp the new ties (without tie plates) up against the rail base. Then, two men with the rail-lifting device raise the rail sufficiently to permit the plates to be inserted on the new ties.

#### Spikes Are Driven Quickly

The portable spike driver was next in line and was used to drive all spikes in the new ties. This unit experienced no difficulty in keeping up with the progress of the remainder of the gang. A machine operator and helper operate this machine. One or both men push the machine to a point near the tie to be spiked and, by holding back on the push handle, apply the brakes. The operator then removes the power hammer from its holder on the machine, and drives the spike, which is held in position for starting by the helper with the aid of a spike-holding tool. When the four rail spikes have been driven, the machine is pushed to the next new tie. A keg of new spikes is carried on the platform of the



TWO MEN equipped with a push car pick up the end and center pieces of the old cut ties, which have been removed from the track with the aid of the tie cutter and the tie-end remover, and haul them to a point of disposal for unloading

portable spike driving machine.

Immediately behind the spikers a man re-applies the rail anchors and adjusts any other anchors that require attention. Two men with a push car follow, picking up the cut pieces of the old ties and hauling them to a place for disposal. Occasionally, one of these men serves as a water boy. These men, together with the foreman, comprise the gang. If the gang should be working on track where flagging is required, two more men would be added.

Last year this same gang renewed ties at the average rate of

12 ties per man-day, using only the two tie cutters. The average cost, including labor, interest on the equipment, fuel, etc. was \$1.05 per tie. This year, with the two additional machines, the gang has averaged 14 ties per man-day at a cost, as stated, of \$0.93 per tie. When tie renewals have been completed on this district, the gang will work on other track maintenance and the two additional machines will be turned over to another district maintenance gang for further experimentation. Each of the machines may be easily removed from the track by two men.



UNDER TRAFFIC, 118½ cu. yd. of concrete was pumped into the forms around the third pier by an air-powered Pumpcrete machine

## Fast Work with Air Tools . . .

The use of a wide variety of air tools powered by a single portable compressor made possible the completion of a project involving the repair of weakened bridge piers and an abutment one day before high water covered the sites.

• By employing a full complement of air-powered equipment to speed the job, the George E. Detzel Company, contractors, Cincinnati, Ohio, rebuilt three concrete piers and an abutment for a 580-ft. railroad bridge at Zanesville, Ohio, beating threatened high water by the narrowest of margins. Involving a bridge of a large eastern railroad the project was begun on August 22, 1951, and completed on December 1 of that year. The following day, December 2, the rising waters of the Muskingum river inundated the last of four cofferdams built in conjunction with the project.

Air tools used on the job included sump pumps, drills, grinders, chipping hammers, paving breakers, jackhammers, vibrators and miscellaneous air motors. Compressed air for the entire project was supplied by a single Ingersoll-Rand Gyro-Flo

## Bridge Repairs Beat

600 diesel-driven rotary compressor delivering 600 c.f.m. at 110 lb.

The steel span was originally supported by three stone piers which were badly damaged when the bridge was washed out in the flood of 1913. When the bridge was rebuilt, the bases of the piers were encased in concrete. Through the ensuing years, the piers were eroded by the swift current of the Muskingum. Consequently it was decided in 1951 that the foundations of the piers would have to be repaired to assure the integrity of the structure. When the work was undertaken it was discovered that a large part of the footing of one pier had been almost completely washed away. The problem was to repair the three piers and the easterly abutment before the usual rainy season raised the river level and made work impossible.

To meet this deadline, the contractor used as much manpower and equipment as could be employed efficiently. Once a cofferdam was pumped out, as many as 40 men were put on the job on a three-

shift basis until it was completed.

Starting on the westerly pier, in relatively shallow water, they first constructed a sandbag cofferdam around the pier and pumped it dry with air-driven Ingersoll-Rand sump pumps. Using paving breakers, they next removed what remained of the old concrete collars and dug a trench 3 ft. wide and 4 ft. deep around the entire perimeter of the pier to reach solid rock. The rock beneath the trench was then solidified by pressure grouting to an additional 4-ft. depth. Pneumatic jackhammers were used for the drilling work required by the grouting operation and also to drill grout holes 6 ft. deep into the stone pier.

### Vibrators Employed

On September 1, after dowels and reinforcing steel had been placed, concrete was poured for the footing of the first pier. A Pumpcrete machine was used to place 49 cu. yd. of ready-mix concrete and two Ingersoll-Rand vibrators were employed throughout the pouring



FOUR sump pumps, like this one, pumped water from cofferdams



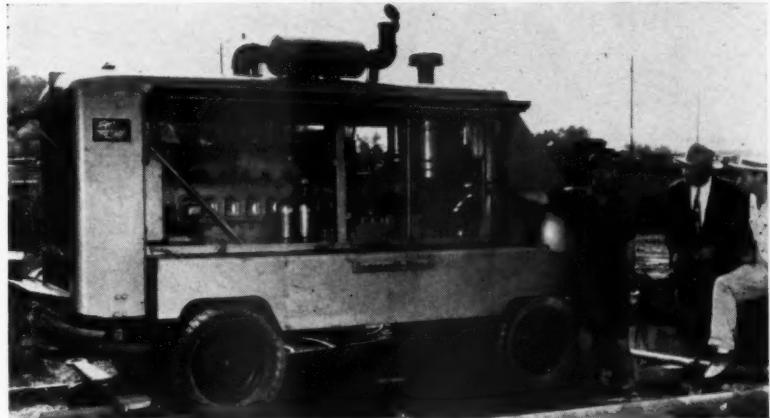
BED for new footing was stripped of old concrete by air tools

## High Water

in order to produce a stronger, more uniform concrete, promote quicker setting and insure a better bond between the concrete and the reinforcing steel. Forms 10 ft. high were constructed on the footing and on September 17, 127½ cu. yd. of concrete was poured for a collar around the original stone pier at the rate of 15 yd. per hour. The Pumpcrete machine and the air vibrators were used for all pouring operations.

After the concrete had set for two days, the forms were removed and the concrete was sprayed with a curing compound. At the joint between the stone pier and the concrete collar, a groove 1 in. wide and 2 in. deep was cut with air chipping hammers and filled with Careylastic.

The collars were anchored to the piers by 1-in. dowels which had been placed in the grout holes in the stone piers during the grouting operation. The new concrete was reinforced with  $\frac{3}{4}$ -in. vertical steel bars tied to steel dowels inserted in the pressure-grouted bedrock. In



THE Ingersoll-Rand Gyro-Flo 600 compressor that supplied all air for the project

addition, two staggered rows of  $\frac{3}{8}$ -in. deformed steel rods were placed horizontally with one row 6 in. from the pier and one row 6 in. from the outside of the concrete.

Footings and collars varied somewhat in size to meet conditions of water and river bed. The largest (easterly) pier required a footing 10 ft. deep on the upstream end, tapering to 5 ft. downstream. The collar rose to 12 ft. above the river bed. The pier is 50 ft. long and 10 ft. 9 in. wide at the bottom and tapers as it rises.

The midstream pier required a 6-ft. sandbag cofferdam which was pumped out with four air-driven

sump pumps and two gasoline-engine-driven 4-in. pumps. The footing, requiring 109½ cu. yd. of concrete, was poured September 26 and the 83-cu. yd. collar October 3.

### Largest Pier Repaired

The easterly pier stands in water as much as 12 ft. deep and it was necessary to construct a wood-framed cofferdam 100 ft. long, 60 ft. wide and 12 ft. thick around this structure. Twenty-six carloads of fill were sent down two chutes into this dam from a work train on the bridge. An air-driven high-lift sump pump sent river water up 33 ft. to



CHIPPED-out groove at joint was later filled with Carey-Lastic



VIBRATORS were used during all the concrete pouring operations



JUST ONE DAY after completion of the project, the rising waters of the Muskingum river inundated the last cofferdam and covered the new footings at each pier

wash the fill down the chutes and spread it. At the same time, other pumps discharged water from the dam. After the preparatory work, which was essentially the same for all three piers, the footing was poured on October 21 and the collar encasing the pier on October 30. A total of 224½ cu. yd. of concrete was used for this pier.

Work on the easterly abutment

started on November 5 with the construction of a cofferdam, after which all loose and disintegrated rock was removed and the footing area excavated and cleaned out. At this time it was found that the stones supporting the seat had been eroded to a depth of 2½ ft. The work of cleaning out the footing excavation had just been completed when the water rose and washed

out half the cofferdam. The dam was rebuilt and the area cleaned out again. As in the case of the piers, holes were drilled into the rock, heavy dowels and reinforcing steel placed, and forms built. On November 17, a footing of 82½ cu. yd. was poured. On November 21, another 82½ cu. yd. were poured to complete the concrete work.

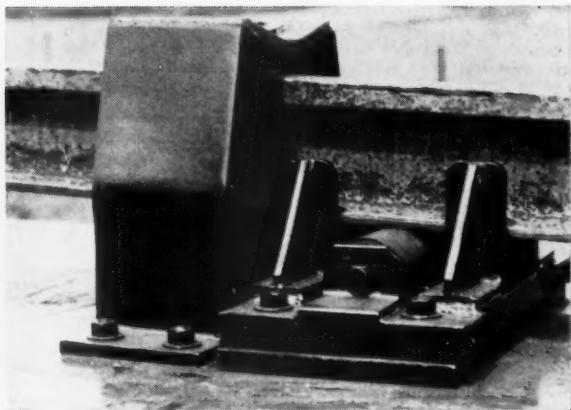
The complete project was cleaned up and all equipment moved from the site on December 1. Heavy rains followed immediately causing the river to rise rapidly with the result that the last cofferdam was entirely submerged.

#### Variety of Tools Used

Air tools and air power played an important part in the swift completion of the project. In addition to the sump pumps for moving fill and pumping out cofferdams, the vibrators for placing the concrete, the pavement breakers for removing old concrete and stone and for excavating the trenches, the jackhammers for rock drilling and pressure grouting, and the chipping hammers for cutting grooves, the contractor used air drills for boring timbers used in the construction of dams and forms, an air grinder for dressing tools and making bolts, a multi-vane air motor to drive the grout mixer and another air motor for the Pumpcrete machine.



A STRING of welded rail (above) is threaded through a special roller assembly and anchored as the flat cars upon which it was loaded are pulled out from under it. The three-roller assembly (upper right) is mounted on a tow car which is connected to the last flat car by a long steel coupling rod (right)



## Device on Push Car

## Keeps Long Rails Upright

When unloading strings of welded rails from flat cars, the R. F. & P. uses a "needle" mounted on a push-car follower to prevent the rails from overturning as they are placed on the ground.

• Anyone who has watched men barring out strings of old jointed rails during relaying operations must also have observed how quickly the whole string will turn on its side when a small section begins to turn. This tendency for rail to overturn can also be a troublesome problem when unloading strings of continuous welded rail from flat cars.

When the Richmond, Fredericksburg & Potomac planned to lay two stretches of 140-lb. P. S. continuous welded rails during 1951, each approximately 2½ mile long, the road devised a tow car with a device through which each string of the rails could be "threaded" with the head up when being unloaded, the purpose being to prevent it from overturning.

The tow car is of the push-car type upon which an assembly of three rollers is mounted. One roller is horizontal on which the rail base rolls while it is being unloaded, and the other two are inclined vertical rollers between which the rail is guided. This roller assembly is fastened by bolts to the middle of the push-car platform when the string of welded rails is to be unloaded in the center of the track. However, if it is desired to place the rails along the outside of the existing running rails, as when a delay between the time of unloading and the actual laying is anticipated, the assembly can be moved and bolted near the side of the platform.

The strings of welded rails are "threaded" through the roller assembly by pulling them with the

same cable which is used as anchorage while the flat cars are pulled from under the rails. The car is towed by a long steel coupling rod fastened to the last flat car.

It sometimes happens that long rails on flat cars become overturned when they are being alined onto the unloading rollers. When this happens after a string has been threaded through the "needle" the rail is returned to the upright position as it is unloaded. To test this feature a long rail was purposely overturned on the cars on a 2-deg. curve. When drawn through the "needle" this rail came to rest in an upright position.

When unloading long rails on curves there is a tendency for them to come to rest against the low rail, even on 1-deg. curves. The road reports that the use of the "needle" car not only overcomes this tendency but makes it possible to place the rails in any position desired between the running rails on curves.

THE TOOL CAR consists of a gondola section, which holds tool attachments for the maintenance car, with a crane at its front end and a cab at the rear. The cab will seat four men and has brake controls so that a pilot crew can stop outfit whenever it is necessary



CRANE BOOM can be fastened in place by chains when not in use

## Tool Car Acts as "Porter" for Ballast-

• For many years the Illinois Central has used self-propelled ballast maintenance cars for scarifying, disking and shaping the stone ballast along the shoulders of its main tracks to maintain proper drainage. With the objective of putting this work on a more efficient and effective basis, this road is now using a late-model ballast-maintenance car which is operated in conjunction with an auxiliary tool car incorporating a crane. This latter car not only carries along all of the necessary tools and attachments but also has a hoist to handle the heavier tools to and from the working arms on the ballast-maintenance car. In addition, the auxiliary car has cab accommodations for a three-man pilot train crew, thus eliminating the congestion which formerly prevailed within the operator's compartment of the ballast-maintenance car.

The ballast-maintenance car forming part of this combination unit is equipped with scarifying teeth for breaking up cemented ballast and can be equipped with a disking attachment for stirring up, throwing out or pulling in the stone ballast; a blade for shaping the ballast and embankment shoulders; and equalizing boxes for distributing the ballast to a uniform section. Also, it is permanently equipped with a front-end plow and side blades for spreading unloaded ballast or removing it from the track to the top-of-tie level.

Formerly, when it was desired to change the attachments on one of the machines to perform a different operation, it was sometimes found that the desired attachment was not immediately available. Furthermore, since the attachments are necessarily of heavy construction, the task of changing them was laborious

and time consuming. It was to overcome these difficulties that the road acquired the new equipment, consisting of a Fairmont W 80 Series "A" tool car towed behind a Model W 77° Fairmont ballast-maintenance car. Since the front-end plow is permanently fixed to the ballast-maintenance car and the scarifiers are always located on the forward working arms, it is only the tools on the rear working arms that are changed out. These include the disks, the ballast shaper blade, and the equalizing boxes, all of which are sufficiently heavy that it is difficult to hold them in the proper position by hand while bolting them in place.

### Car Has Gondola Section

These tools are carried on the tool car on a gondola section, which is of all-metal construction and has a storage area, about 6 ft. by 12 ft. in size, with a load capacity of 5 tons. The side panels are removable and the floor deck is of heavy expanded metal. The mast of the hoist is securely mounted at the end of the car adjacent to the ballast-maintenance car. The hoist boom reaches the entire length of the gondola section and can be swung manually through 360 deg. When not in use the boom is secured to the sides of the car frame. A chain hoist, having a capacity of  $\frac{1}{2}$  ton, travels the length of the boom so that an attachment can be picked up from any part of the gondola section and swung into position for bolting to the rear working arms of the ballast-maintenance car.

The cab, equipped with four adjustable swivel seats, is at the opposite end of the car and is fully enclosed by rubber-mounted safety-glass windows. Within the cab, a hand valve is available for service applications of the

\* A detailed reference to this equipment appeared in the February, 1950 issue of *Railway Engineering and Maintenance*, page 156.



PLOWING ballast out of track center while doing side-arm work

## Maintenance Unit

brakes on both the tool car and the ballast-maintenance car. Also there is a control for the air-actuated horns. Hence, the outfit can be stopped by the train crew whenever it is deemed necessary, and can be run backwards to a siding. Provisions have also been made for the attachment of rear train markers and lights as well as for headlights.

### Operation of Unit

Generally, ballast-maintenance work with this equipment is done out-of-face on the Illinois Central. In double-track territory the work proceeds first on one main track and then the other. In some instances it has been found expedient to leave gaps in the out-of-face work when ballast conditions require a different tool attachment. But, in general, to avoid undue back-tracking of the outfit, the tools are changed as required by variations in the conditions encountered. The outfit is turned on a wye track or turntable, when such a movement is necessary.

The work of this outfit is carefully scheduled. This year it started the season's work about March 15 on a job that involved equalizing ballast that had been unloaded late in 1951 on both main tracks between Effingham, Ill., and Centralia. From April 1 to May 19 it was scarifying and disked both main tracks between Effingham and Champaign, after which it worked on both main tracks northward from Champaign towards Chicago on the same kind of work. In carrying out this schedule, all the available attachments were utilized from time to time as required, the changes of attachments being readily made with the assistance of the crane-tool car.

Attachments for use with a ballast-maintenance car on the Illinois Central are carried on a tow car equipped with a crane hoist to facilitate changing them on the job as required by conditions. The tow car is also equipped with a cab for accommodating the pilot train crew.



WHETHER disk, blading or equalizing of ballast is required, operations can be varied quickly by changing tool with crane



AFTER having been disked outward for drying, the stone ballast is now being bladed up closer to the ends of the ties



THE FIRST STEP in repairing deteriorated concrete marine piles, such as the one shown above, is to set an open-topped caisson around the pile. The caissons (right) are floated into position in two separate sections, tightly sealed and pumped dry before any work is begun



## Concrete Marine Piles Repaired in Miniature "Floating Dry Docks"

Small, buoyant half-caissons\* are floated into position around individual piles, clamped together and dewatered to provide dry cofferdams in which workmen can effectively rehabilitate disintegrated areas.

• The deterioration of reinforced-concrete marine piles that frequently occurs within the limits of fluctuating water levels is no longer the bugbear it was once considered. In the first place, modern methods and materials used in the construction of concrete piles have been improved through research so that they are now better able to combat the adverse effects of severe exposure to alternate wetting and drying combined with freezing and thawing. In the second place, modern, effective methods of repair have been devised to simplify the restoration of those piles which do disintegrate in spite of increased durability built into them.

The added resistance to weather-

ing has been accomplished by the following improved manufacturing techniques: (1) Piles are now being designed with more concrete surrounding the reinforcing steel. (2) They are being poured with a richer mix (lower water-cement ratio). (3) The concrete is being vibrated to provide greater homogeneity. (4) They are getting better curing. Finally, (5) air entrainment is being used to obtain greater resistance to alternate freezing and thawing.

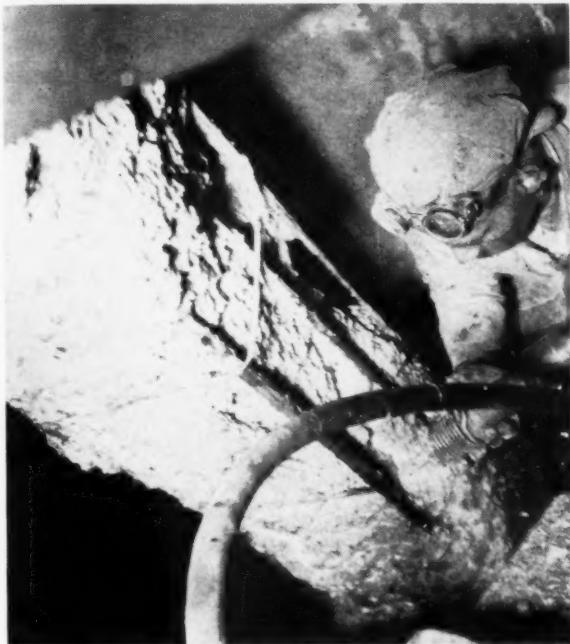
However, even these improvements have not eliminated all the deteriorating effects of severe exposure. Repairs are still necessary. But here, too, greater effectiveness and lower costs are possible, largely through a special repair system called DRI-POR, devised by the

Masonry Resurfacing & Construction Co., Inc., Baltimore, Md. This system was designed to eliminate the specific deficiencies of older methods of repairing concrete piles, especially in tide-water harbors. Recognizing these deficiencies as arising largely from an inability to obtain economically a clean dry area on which a new concrete jacket can be made to bond, the company aimed its improved methods at this phase of the repair work. The trouble, it was decided, arises from the necessity, in old methods, of divers having to work almost blindly in murky waters to clean the disintegrated area and then place about the pile a form which does not permit detection of subsequent oil films which may coat the cleaned area during tide fluctuations.

An obvious, but wholly impractical, solution to these disadvantages would consist of the use of an open caisson constructed around groups of piles. Since high costs prohibit the use of this solution,

\*Patents pending

THE ERODED concrete is chipped away (below) until sound material is exposed. Wire mesh (right) is then anchored to the pile to reinforce the new concrete. A special form, independent of the caisson, is then placed around the pile



how could a similar effect be obtained at lower cost? Would a smaller caisson work? If so, how small could one be built that would work?

#### New Caisson Developed

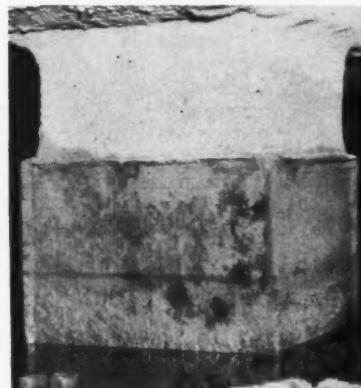
In mulling over these hypothetical questions, the designers of the Masonry Resurfacing & Construction Company, Inc., evolved what is probably the smallest caisson ever built and used effectively—thereby solving the troublesome concrete-pile repair problem to their satisfaction. Having done so, they applied for a patent on the caisson and its several features. That patent is still pending.

These caissons are made in halves so they will fit around a single pile and provide room for a man to handle demolition tools. They are made only deep enough to surround the disintegrated area within the limits of tide or stream flow fluctuations. Finally, they are buoyant so they can be floated into position and clamped to their respective piles.

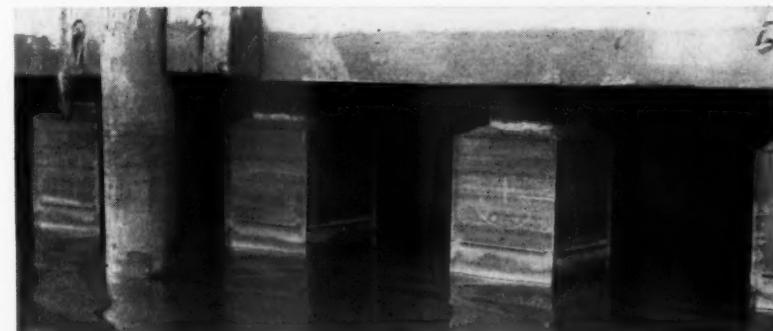
The DRI-POR system, using these caissons, follows the older methods in so far as the various repair steps are concerned, but does it so that workmen do not work "blindly." After a caisson is set in place, it is sealed to prevent water



CAPPING THE TOP of the repaired pile is the final step. Exposed pile is roughened to provide bond and wire mesh reinforcing fastened in place



SHOTCRETE is then sprayed under pressure by a conventional method on the upper portion of the repaired pile around which the wire mesh was placed



THE SPECIAL, galvanized metal forms are left in place for further protection

from entering around the pile. It is then dewatered until very little water remains on the floor. If water should seep into the caisson, the dewatering pump is run continuously to keep the working area dry at all times. Thus, with the weathered and "necked-down" section of the pile clearly visible and in the dry, a workman can effectively remove the "rotten" concrete and prepare the pile for encasement.

#### Permanent Form Used

At this point in the repair work, another innovation of the DRI-POR system makes its appearance. This is a specially designed galvanized metal form that is sectionalized to facilitate its placement around the pile. This form is intended as a permanent retainer for the concrete

encasement to be poured around the prepared pile. The form is so designed that it bulges a negligible amount during pouring. It is set independent of the caisson so that it is at least six inches from the caisson floor. In this way neither movements of the caisson itself nor water leaking into it can damage the freshly poured concrete. When the form has been secured against movement, the concrete is poured around the clean, dry pile with assurance of a strong bond between the old and new concrete.

When convenient after the concrete is poured, the caisson is detached from the repaired pile and moved to the next pile to be prepared. The form, however, remains as a permanent protection to the encasement. After a number of piles in a bent have been encased,

the tops of the piles above the encasement are built up by shotcrete applied in a normal manner.

#### Limitations of Use

Although the DRI-POR system is suitable for repairing concrete marine piles at most locations, it cannot be used where adjacent piles are so close together that the smallest permissible caisson cannot be made to fit around the individual piles. Neither can it be used where the piles are arranged in clusters. Naturally, the range between low and high tide at the structure to be repaired must be well within the depth of the caissons available. Because of this consideration the caisson method has been used only where tide ranges are relatively small.

## Railroaders Devise Level Indicator for Sand Tanks

• Since the advent of diesel motive power, more and more elevated steel dry sand tanks have been erected throughout the country. Since some of these tanks are not equipped with gauges or indicators to show the level of sand in the tank, it is necessary to climb to the top of the tank and remove the hatch cover. Likewise, if it is attempted to fill tanks beyond their capacities, feed lines become clogged and subsequently have to be cleared. For the purpose of eliminating the inconvenience and delay caused in these instances, two railroad men put their heads together and came up with a unique gravity-type sand level indicator. Both employees of the Western Maryland, these men, James L. Dougherty, supervisor of bridges and buildings on the Elkins division, and W. O. Bane, gang leader, now have patent rights pending on the device.

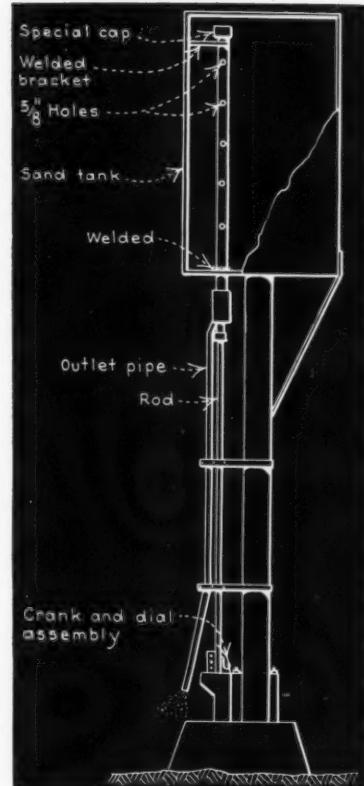
#### Concentric Tube Design

The indicator consists basically of two concentric tubes which extend up into the sand tank. The outside diameter of the inner tube is between  $\frac{1}{16}$  in. and  $\frac{1}{32}$  in. less than the inside diameter of the outer tube. The outer tube is perforated with a vertical line of  $\frac{1}{8}$ -in. holes spaced on centers determined

by the desired indicating levels in the sand tank. The inner tube also has  $\frac{1}{8}$ -in. holes drilled at the same centers as the outer tube, but on a spiral rather than a vertical line. The outside tube is supported by brackets welded to the wall of the tank and by welds made where the tube enters the bottom of the tank. The inner tube is supported from the top on the wall of the outer tube by a specially designed cap. Between this cap and the wall of the outer tube is a race containing ball bearings.

#### Indicating Dial at Base

The inner tube is fitted with a rod at the bottom which extends downward to the base of the tank substructure where it connects with a crank, located above an indicating dial. Thus, by rotating the crank, the inner tube can be turned within the outer tube to align one set of holes at a time. In practice, when this is done, the sand in the tank runs through the matched holes, down the inner tube, and thence to a pipe which drains onto the ground or into a container. When sand issues from this pipe, the operator knows that the level in the tank is equal to or greater than the indication on the dial. When not in use, the crank is securely

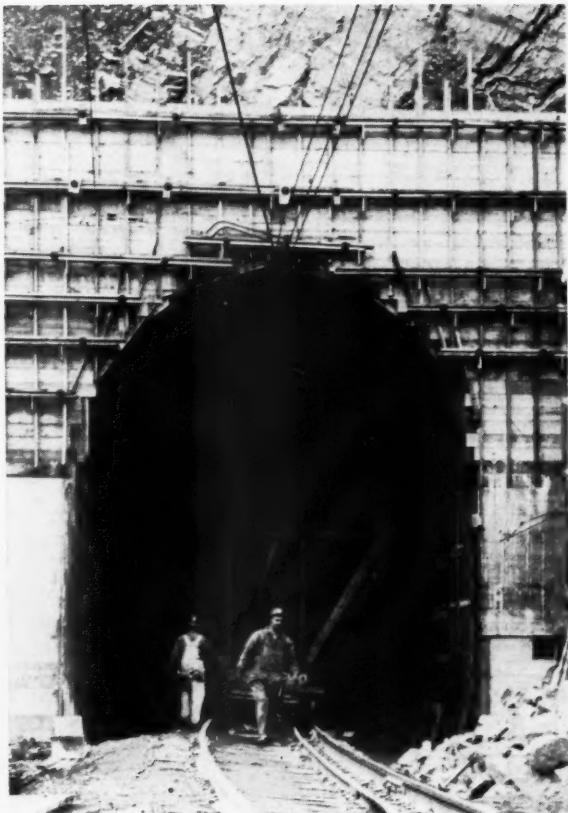


DETAIL showing constructional features of the sand tank level indicator developed by Messrs. Dougherty and Bane and now in service on the Western Maryland

locked to prevent its being accidentally turned to release sand.

The first gauge of this type was installed on a 20-ton Roberts & Schaefer steel elevated tank located on the Western Maryland at Thomas, W. Va.

**TYPICAL** of railroad projects for which protective helmets are used is this one in Idaho where a Milwaukee Road crew rebuilt the portal of a tunnel and relined a 470-ft. tube. Work going on overhead and at ground level exposed crews to hazards of falling tools, rocks and other objects. Note in the picture below the winter lining in hat worn by worker in foreground



**By C. V. Peterson**

District Safety Engineer  
Milwaukee Road  
Butte, Mont.

## Hard Hats for the "War" on Injury

• Since the days of the cave man, hats have been fashioned and worn for a variety of reasons. At first, of course, the idea of a head covering was conceived as a means of protection against the elements. Man, however, was also a practical being then as he is today and was not long in discovering that, by changing the material and construction of his hat, it could be made to serve the extra, and more important, function of protecting his head from blows that might cause injuries. Thousands of GIs owe their lives to their "tin" hats and helmets. The principle of the soldier's helmet is used today on the Milwaukee Road and in many other industries as a means of protecting men whose work exposes them to the danger of head injuries due to falling or flying objects.

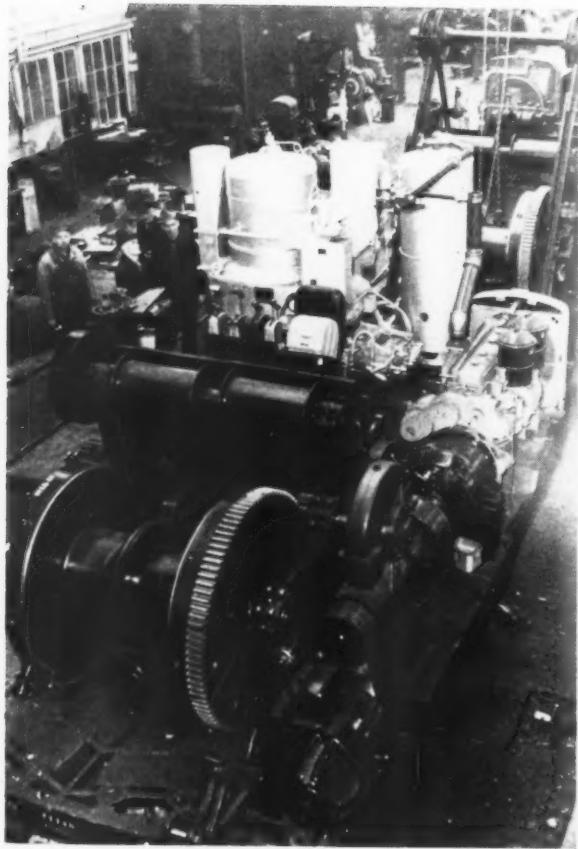
Safety helmets are designed according to the needs of the wearer. Some are constructed of lightweight metals, some of specially-prepared spun glass, and others of various compositions whose particular characteristics have been found to be well suited to certain uses, such as being waterproof, shockproof, and oil or heat resistant.

One particular type in general use on the railroad is

constructed of a strong molded composition, rounded sufficiently to deflect an object striking it from almost any angle. Being light in weight, it is comfortable, and since it "floats" in a hammock-like device which fits over the head, the cutting force of a falling object is not only broken, but the shock of the blow is lessened. In addition, the hammock provides a space between the hat and the wearer's head for free circulation of air during hot weather, or space for the winter liner when needed.

Many a Milwaukee Road man, going home uninjured at the end of the day, has thanked his hard hat for making it possible for him to do so. Milwaukee Road rock quarry crews, bridge crews working below the decks of bridges where tools or pieces of material might be dislodged and fall from overhead, section men removing loose rocks from the face of cliffs or ice from roofs and walls of tunnels, trolleyline crews, mechanics working in engine drop pits, and various other crafts, have found that the best insurance against head injuries is a properly fitted hard hat.

Like the soldier's helmet in battle, the hard hat is essential equipment in the railroad man's war on injury.



← A STEAM GENERATOR will power the pile driving hammer of this new 50-ton Industrial Brownhoist crane being built at Bay City, Mich., for the Western Pacific. However, the crane itself will be operated by diesel electric power



FEATURING ease of operation, these four-fold double railway entry doors, manufactured by the Electric Power Door Co., Minneapolis, may also be used for car and diesel shops



PRE-ASSEMBLED RETARDERS were one of several methods used by the Milwaukee Road to hasten the revamping of its Air Line yard at Milwaukee, Wis., to a gravity-retarder yard. Here, locomotive cranes are lifting a half-section of the master retarder from a car to place it in its final position



MOUNTED ON RAILS atop a flat car, the derrick car shown above, manufactured by Fairmont Railway Motors, Inc., Fair-

mont, Minn., was recently put to use on the High Point, Thomasville & Denton for the loading and unloading of rails

# WHAT'S THE ANSWER?

An open forum for maintenance men on track,  
bridge, building and water service problems



## Fire-Retardant Treatment of Plywood

Can plywood be given fire-retardant treatment? How? If so, what possible applications would such fire-resistant plywood have on the railways? Explain.

### Impregnation Is Best

By C. F. HARTMAN

Executive Vice-President, Protexol Corporation, Kenilworth, N. J.

Can plywood be given a fire-retardant treatment? The answer is a resounding "yes." The word treatment, however, should be qualified. A vacuum-pressure method of impregnation offers the ultimate since permanence must be considered. It is fair to assume that railways are interested in preservation as well as fire retardance. A specification requiring a pressure treatment offering triple protection, namely against decay, insect attack, as well as fire, is strongly recommended. Can this be done? Again the answer is "yes."

Whether solely fire-retardant or a comprehensive type of treatment, the procedure involves an impregnation, by the full-cell method, with a water-borne solution of salts. This, therefore, requires that an exterior grade of plywood be submitted for treatment since interior grades would tend to delaminate in processing. The pound retention of dry salt per cubic foot would depend on the type of treatment specified as well as on the end use.

In rendering plywood fire retardant, the aim is to impart to it the ability to prevent the spread of flame, as well as to repel the penetrating ravages of a fire. Plywood which has been properly treated to render it fire resistive will neither ignite, nor sustain or support combustion. When exposed to extreme heat or flame, it will char at the point of application but the destructive effect of the flame will be confined to the point of contact. The insulating value of treated plywood is extraordinary. The effort, therefore, toward rendering wood

fire retardant is to reduce its inherent combustibility.

Combustion is controlled in one of three ways: (1) By injecting chemicals into the plywood which, upon the application of elevated temperatures, give off noncombustible gases which mix with the flammable gases given off by the heated plywood and render them noncombustible; (2) by the use of chemicals which fuse or form a glass-like coating over the fibers of the plywood; or (3) by using chemicals which give up waters of crystallization that are gradually released as the plywood is heated during a fire. Most of the processes

in commercial use combine at least several of these groups of chemicals which are injected into the lumber and remain fixed until their flame-protecting qualities are liberated by heat.

The advent of water-resistant adhesives permitted the impregnation of plywood in its bonded form. Architects employ fire-retardant plywood as core stock for wainscoting and paneling. The application of face veneers to meet esthetic decorative whims find many uses of fire-resistant plywood. It is well to remember that treating procedure and subsequent kiln drying should be placed in the hands of the experienced. The kiln drying of properly treated plywood is trying, even to the initiated.

Fire-retardant plywood is being supplied in increasing quantities where building-code requirements prohibit its use when untreated. In

Answers to the following questions are solicited from readers. They should be addressed to the What's the Answer editor, Railway Engineering and Maintenance, 79 W. Monroe St., Chicago 3, and reach him at least 30 days in advance of the issue in which they are to appear. An honorarium will be given for each published answer on the basis of its substance and length. Answers will appear with or without the name and title of the author, as may be requested. The editor will also welcome any questions which you may wish to have discussed.

### To Be Answered In the October Issue

1. What characteristics of construction and appearance should temporary slow signs have to assure their visibility and facilitate their placement? Explain. Where should they be placed relative to the work or situation requiring restricted speeds? Why?

2. What effect does the time of mixing have on concrete when air-entraining cement is used? When normal cement is used and an air-entraining agent is added at the mixer? Why?

3. Under what conditions, if any, is it economical and practical to place concrete slabs under railroad crossing

frogs? What is the minimum depth of ballast that should be used under the ties in such an installation? Explain.

4. What effective methods can be used to attach blast plates to the undersides of steel overhead bridges? Explain.

5. What special measures, if any, should be taken to assure that propane-type switch heaters will operate at full efficiency when temperatures are extremely low? Explain.

6. How can repair parts be obtained for certain types of water columns no longer manufactured because of reduced demand brought about by dieselization? Under such circumstances, what other expediencies are possible? Explain.

these cases, test procedures and criteria vary. Perhaps the outstanding code requirements are those embodied in the administrative Building Code of the City of New York. The Basic Code of the Building Officials Conference of America also covers the subject of fire-retardant plywood and offers test procedures and criteria. It is strongly urged that performance specifications be demanded. Quality admits no substitutes.

The Underwriters' Laboratories, Inc., Chicago, has investigated Douglas Fir Plywood rendered fire retardant under their Tunnel Test procedure, described in their Bulletin of Research No. 32, dated September 1944. It is interesting to note that, in this investigation, untreated fir plywood was found to have a factor for classification (flame spread) of 259.0. Fir plywood treated for fire-retardant qualities was found to have a factor of classification (flame spread) of 32.4 as compared with untreated red oak at 100.0. For reference, this information can be found in the Underwriters' Report R2282.

Douglas fir plywood, pressure treated to render it resistive to fire as well as decay and insect attack, was found to have a factor of classification (flame spread) of 25 to 30. This investigation is covered by Underwriters' Report R3192.

Inspection sheds and maintenance shops are large users of wood and plywood. The danger of fire is ever present. Plywood lends itself to so many varied uses that time and space preclude listing them all. It is submitted that wood which, through nature, is endowed with excellent acoustical and insulative qualities, not to mention its beauty and workability, will always be considered by designers and engineers as well as decorators. Why, therefore, overlook the possibilities offered by the wood-preserving industry to render wood and plywood safe from decay, insect attack, and last, but certainly not least, fire?

#### **Either Impregnate or Coat**

By THOMAS C. SIAS

Publicity Department, Douglas Fir Plywood Association, Tacoma, Wash.

Yes, Douglas fir plywood can be treated to increase, to a considerable extent, its resistance to fire, either by application of a fire-retardant coating or an impregna-

tion treatment with fire-retardant chemicals.

The principal effects of impregnation with fireproofing treatments are to decrease the rate of flame spread and ignition of the wood, to retard the normal increase in temperatures due to the ignition of wood under fire conditions, and to lessen the rate of destruction of wood in contact with fire. Fire-retardant chemicals used in pressure treating plywood are carried in a water solution and it is therefore essential that exterior-type Douglas fir plywood, with completely waterproof glues, be used for this treatment. Exterior plywood is made with synthetic phenolic resin adhesives and may be identified by the grade trademark "EXT-DFPA" branded or burned into the edge of every panel.

The degree of fire resistance achieved with fire-retardant chemicals is recognized by the Underwriters' Laboratories, Inc. For example, in their "Fire Protection Equipment List" for January, 1952, the rate of flame spread for Douglas fir plywood impregnated with fire-retardant chemicals is listed as 25-45 as compared to 100 for untreated red oak. In this classification, the lower rating indicates a greater resistance to fire and flame spread. The Underwriters' Laboratories, Inc., specifically name the following materials as satisfactory for use in the pressure-treatment process: (1) Minalith "grade H" and "grade M"; and (2) "Protexol Class A" or "Protexol Pyresote."

The impregnation treatment mentioned above is perhaps the most satisfactory for all-around use because all areas of the plywood are protected with a reasonably permanent treatment. A coating, on the other hand, to give similar protection, would have to be applied over the entire panel and perhaps renewed at intervals to maintain the desired efficiency.

Standards for methods of impregnation are rigidly prescribed to insure uniformity of product. The impregnation treatment is carried out in closed cylinders by a pressure process, generally in accordance with the standardized procedure of the American Wood-Preservers' Association specifications. This assures deep and uniform penetration and a high absorption of chemicals. The treating conditions are under positive control which produces fire-retardant lumber or plywood that fully conforms to the specifications.

When fire-retardant impregnated

plywood is used outdoors for walls, doors, stairways, catwalks, or in railroad cars where it would be exposed to water, it should be protected with an adequate paint coating such as a good exterior aluminum house paint.

Fir plywood treated to resist fire should be useful as a building material for enginehouses, shop buildings, tunnel linings, and floating platforms; for housings for high voltage electrical circuits, switch panels, and gasoline motors; and for any other applications requiring plywood's combination of great strength and light weight.

Fireproofing of plywood is not a new idea. A pressure processing of plywood with fire-retardant chemicals was perfected during World War II and literally hundreds of thousands of square feet have been treated in this way. During the war, because of the structural advantages of plywood, it was used in many places subject to fire hazard such as hangars, barracks, boats and other applications.

#### **Good Grades Can Be Treated**

By D. L. DAVIES

Chemical Engineer, Wood Preserving Division, Koppers Company, Inc., Orrville, Ohio

Exterior-grade plywood can be treated with fire-retardant salts very readily and without delamination. The fire-retardant solutions used penetrate through the lines of glue but do not affect its bonding strength. To the best of my knowledge, less-expensive grades of plywood cannot be given fire-retardant treatment without delamination taking place.

The first step in the treatment consists of loading the sheets of plywood on trams in such manner that they are fully supported and cannot bend or deflect during or after the impregnation. The trams are then pushed into large cylinders, the cylinder doors are bolted, and the plywood treated by a full-cell process. In short, this process consists of evacuating a portion of the air in the cell walls of the wood by pulling a vacuum on the cylinder, then filling the cylinder under vacuum with the fire-retardant solution and injecting additional solution using pressure. The process results in retentions of approximately 30 lb. of solution or three to six pounds of dry salt per cubic foot. After impregnation, the plywood is

stacked for either kiln drying or air drying under roof. Kiln drying is preferred because of the greater control that is possible.

There is a wide application for fire-retardant treated plywood. It can be used for sheathing, paneling and decking or sub-decking. The advantage of its use lies in the fact

that the treated material will not spread fire an appreciable distance away from an igniting source.

The railways should consider its use in the construction of engine houses and repair shops where the high insulating value of wood and its inherent resistance to acid attack make it a valuable construc-

tion material. Some railway suppliers are using treated plywood in the construction of rolling stock to protect the plywood against decay. Certain fire-retardant salt solutions, such as chromated zinc chloride (FR), combine protection against both decay and fire and naturally suggest themselves for this use.

## High Standards in Yard Maintenance

To what extent is a high standard of track maintenance in yards essential? Explain. How can it be accomplished?

### Good Tracks Speed Freight

By W. T. RICE

General Superintendent,  
Richmond, Fredericksburg & Potomac,  
Richmond, Va.

The maintenance standard of yard tracks should be as high as necessary to afford a safe, continuous operation at the maximum speed consistent with the yard layout and operating practices. This standard will, of course, vary between yards, and between certain tracks within a yard.

The great criticism against railroad movement on the part of traffic men throughout the country appears to be the delay in terminals. This is very forcibly presented at Regional Shippers Advisory Board meetings, where traffic managers of all types of concerns tell the railroad operating people of their difficulties. The one place where we now need to increase the speed of movement is in yards.

The standard of maintenance will frequently govern whether or not heavy delays occur to hundreds of cars in their movement from consignor to consignee. It is just as important that a yard track be maintained sufficiently sound to perform its function in the overall movement of freight as any other railroad track or facility that may be used in the movement of this freight. The present heavy loss and damage claims, as well as claims due to delayed perishables, in many instances, have a direct relationship to the sub-standard track maintenance in yards through which these cars must travel.

Better yard maintenance can be accomplished by over-ruling that out-moded belief that any type of track material or any caliber of supervision will do in a yard. A broken switch point or frog on some important track, such as any

of the approaches to a hump, can frequently be of far greater cost to the railroad in the amount of traffic delayed, than the saving due to the use of secondhand materials. We must take a new look at the importance of our terminals and yards and provide them with the proper materials and people with the necessary "know how" to maintain the tracks at all times suitable for continuous use by the operating people. We cannot afford to do less, as the price of delayed freight traffic far exceeds the cost of good maintenance. We further cannot afford to use the present high-cost labor in installing material that is worn to a point where its life expectancy is considerably less than would be normally expected.

We must find ways of expediting freight movements. One of the best places to begin is in the design and maintenance of yards.

### Depends on Yard Use

By R. W. PUTNAM

Engineering Maintenance of Way and  
Structures, Southern Pacific, San  
Francisco, Cal.

The standard of maintenance in yards should depend upon the nature of the use of the yard, that is, whether it is a heavy switching yard, merely a storage yard, or a set-out yard. The efficiency of a switching yard where trains enter, are broken up, classified, blocked, and where trains depart, should naturally be maintained to such a degree that the movement of power and cars can be accomplished with maximum efficiency. Speed, which is so essential in switching, cannot be accomplished where tracks are in poor surface, where footing is bad, switches in poor condition, or

where defects exist which cause any type of slowing up. Therefore, a high standard of maintenance is desirable and is justified in switching yards.

The surface and grade of tracks should be such that switching crews can always depend upon the distance and speed at which cars will roll. This cannot be accomplished without a rather high standard of maintenance. Roughness of track also adds to the damage to lading whenever it is great enough to permit cars to roll sideways and vibrate up and down due. Minimizing damage to lading is being recognized more and more as one reason for high-class maintenance in a yard. Safety is another reason. The footing between tracks and along the leads where switchmen must walk should be maintained in a smooth and even condition.

The manner in which high-class maintenance in yards can be accomplished is the real problem. If the same interest and consideration is given yard maintenance as is given to ordinary main-line tracks there would be no problem. Maintenance people are rather neglecting the maintenance of yards, i.e., giving preference to main lines in allocating available funds covering labor and material. This, of course, is due to the general fact that we, as well as the public which we serve, more or less demand that main tracks be highly maintained. A certain amount of this deferred maintenance in yards may not always be necessary and is more the result of maintenance people not being determined enough to see that important leads and switching tracks are improved. With sufficient determination it may, at times, be possible to work toward a program of raising the standard of yard-track maintenance.

Unless work is definitely planned it is an easy thing for a foreman to spend time on the main track when actually the work might not be needed. The supervisor whose district comprises both a main line and yards should definitely keep

before him the idea that work in yards is necessary and must line up his foreman to give as much attention to yard-track repairs and improvements as he can in view of the actual needs of the main track.

Therefore, sufficient funds should be made available for putting switching leads and yards in good condition, insofar as good rail, ties, ballast and footing is concerned, and maintenance forces should recognize the importance of keeping them at a reasonably high standard of maintenance.

### Maintain to Prevent Delays

By H. C. KOCH

Roadmaster, Belt Railway of Chicago

The primary need for yards is to sort or classify cars by various switching operations into trains for other destinations. Designed and maintained properly, they can be operated efficiently. The economical movement of cars to meet scheduled connections safely and without damage to equipment and contents is an operating department goal and when a large-volume business is handled with minimum delays, conditions are ideal. Maintaining fast schedules on main lines is wasted effort if cars are delayed in yards for any reason.

Yards are designed to meet certain maximum requirements. The number of cars handled is an important factor that determines unit costs for both the operating and maintenance departments. Handling a small amount of cars is not economical but plugging a yard with too many cars can also be costly.

To maintain yards so they can be operated efficiently requires close attention to the following factors: (1) Allocate sufficient force to each yard, or part of a yard, and instruct foremen and men to become thoroughly familiar with local conditions. (2) Tool houses should have ample room and should be properly located. (3) Provide sufficient tools and equipment, including, when useful, power-operated tools such as tie tampers, grinders, drills, and wrenches. (4) Cooperate with the operating department in taking track and other facilities out of service. Careful advance planning is necessary when leads, ladders and important tracks are involved.

(5) Care should be taken when selecting and installing secondhand material. It should match with

other material used or in the track and have sufficient additional service life to warrant its installation. Welding repairs to worn frogs, switch points and to low rails at joints has proved to be economical. (6) Adequate drainage properly maintained is very important. Too often yards located in flat territory are not drained sufficiently and require more maintenance than would otherwise be necessary. (7) Yard tracks, leads and other facilities should be kept as clean as possible for safe operation. (8) Tracks over which movements are in one direction only should be anchored sufficiently to prevent creepage. (9) When materials are worn out and too light for the traffic handled, recommendations for renewal and improvements should be forwarded to the management. Heavy operations over worn or inadequate materials requires more maintenance resulting in delays.

The prevention of train accidents is important for efficient yard operation. Switches, maintained properly, will prevent many accidents and relieve maintenance departments not only of responsibility for individual accidents but also of the expense of repairs. The use of automatic or "safety" switch stands has greatly reduced accidents at switches.

### Also Improves Morale

By H. B. CHRISTIANSON, JR.<sup>o</sup>

Assistant Engineer, Santa Fe, Chicago

A high standard of track maintenance in yards can help to reduce (1) delays to the movement of freight, (2) accidents, (3) damage to lading, and (4) personal injuries, and it can also increase morale.

Yard delay is the biggest item in lost transit time. Neglected track maintenance can cause a small indeterminate part of this delay. Congestion of traffic and communications, inherent in yard operations, sometimes precludes prompt restoration after emergencies. A minor yard derailment at a critical time and location can halt operations on entire operating districts of several railroads.

Good maintenance speeds up routine switching and improves safety. Faulty drainage, poor house-keeping, weeds, switches which

<sup>o</sup> Between June 7, 1952, and June 13, 1953, Mr. Christianson is pursuing graduate study at Massachusetts Institute of Technology under a fellowship awarded by the Alfred P. Sloan Foundation, Inc.

throw hard, and rough track, hurt operation most, especially in darkness or bad weather. Poor maintenance invites "loss and damage." Where all tracks in a classification yard have uniformly good surface, switching is improved and damage reduced.

A high standard of yard maintenance is necessary where section forces seldom have convenient access to tracks for inspection and repair. To take tracks out of service for repairs, disturbs yard operations.

Applying better track materials and using yard cleaning devices facilitate good maintenance. A light, worn track structure exists in many yards even though the heaviest engines and loads generally use any track. Recently developed excavating and yard cleaning machines can perform work which otherwise may be too expensive. Good judgment can determine if these improvements, better methods or more labor are economically justified.

Rail-joint conditions in yard tracks should be watched. A load can cause as much joint damage and settlement at some slow speeds as at higher speeds. If continuous welded rail proves its merits in main tracks, it may be even more successful in minimizing joint troubles in yard tracks.

Standards for gradient, curvature, turnouts and layouts in yards have changed considerably over a period of years. Long-range master plans for a railroad's yard improvement program might insure more efficiency in making minor or routine changes under engineering supervision.

### Must Meet Design Basis

By J. E. GRIFFITH

Assistant Chief Engineer, M. W. & S., Central Lines, Southern, Knoxville, Tenn.

The standard of maintenance desired for a yard has a direct relation to the volume and type of business handled. Although there are some tracks in most yards on which fast speeds are maintained, these are few and will not be considered a part of the yard in this discussion. The standard of maintenance in any yard should be regulated by the business handled therein and no one yard can be used as an example or a guide for maintenance standards in other yards.

Due to slower speeds in general,

yard tracks are not subjected to the same impacts and stresses as main tracks. However, yard speeds in many cases are as fast through turnouts as would be permitted through turnout springing from the main track, and generally speaking, yard turnouts are used more than those in the main tracks. Therefore switch maintenance in yards should be kept at a higher standard than many maintenance men think is essential.

It is most important that some yard tracks be maintained at the designed grade, cross level, and gage. This is especially true of classification tracks in hump-retarder yards. One can not expect the cars to roll uniformly on tracks after the grade and cross level have broken and where the gage is irregular. Only a high standard of maintenance will give the type of performance for which the yard was designed.

Standards of maintenance that are too low to meet the requirements of a yard are costly. The railroad receives absolutely no benefit from the money spent for crews clearing wrecks and maintenance crews repairing tracks after derailments. There are vital points in yards, known to all who operate them, where a derailment can para-

lyze yard operations. High maintenance standards in these places are most essential. Derailments not only damage the rolling stock and lading, they damage our "public relations" as well as the track structure and shorten the life of timber and other track material. Maintenance standards high enough to meet the requirements of each individual yard are essential to safety and economy.

checked often because an engine or car "on the ground" because of wide gage can detain a train and prove to be expensive and very troublesome.

A supply of good secondhand rail anchors should be used on lead tracks because of the sudden starting and stopping of heavy switch engines. Bolts in the rail joints on leads should be checked often and replaced when necessary.

A poorly drained yard is also a neglected yard. Water should not be allowed to collect in or around tracks particularly in the winter months. Adequate drainage in yards is essential.

A high standard can be maintained by assigning gangs exclusively to the yards and having them responsible for their condition. In a very large yard it may be found necessary to have two or more gangs work daily. On the other hand in a small yard it may be necessary to have the gang work a few days per week in the yard and spend the rest of the time on the main tracks or elsewhere.

In any case, keeping the yard in good condition will pay off in the long run through fewer derailments and less delays as well as through faster service to shippers and safer yard operation in general.

### Poor Drainage Shows Neglect

By CHARLES L. MELILLO

勞工—工程學生，Lehigh Valley, South Plainfield, N. J.

The standard of track maintenance in yards should be kept fairly high. By this I do not mean that new material be used, but second-hand material in good condition is certainly indicated. In large yards, such facilities as switches and retarders should be kept in their best working order. Manual switches in smaller yards should be kept in good condition and not be allowed to become stiff or hard to throw.

The gage of track is sometimes neglected in yards. To prevent such neglect, the gage should be

## How to Handle Gas Cylinders Safely

What precautions are necessary for the safe handling of oxygen and acetylene cylinders when used for maintenance work? Other equipment used in gas welding and cutting? Explain.

### Treat Them With Respect

By L. W. DUTTON

Staff Representative, Railroad Section,  
National Safety Council, Chicago

Oxygen and acetylene cylinders have been used on railways for so long that their presence on the properties is taken as a matter of course. In fact, all too often they are regarded with much less respect than they should be. Handled carefully they are safe, but handled carelessly they can be very hazardous.

Instructions for the safe handling of compressed-gas cylinders have been issued by the National Safety Council in pamphlet form in Section 14 of its Accident Prevention Manual for Industrial Operations. That pamphlet contains the following advice.

Oxygen is supplied in cylinders, the usual size for welding containing 220 cu. ft. of gas under pressure of 1800 to 2200 psi at 70 deg. F. A cap should be provided to protect the outlet valve when the cylinder is not connected for use.

Acetylene for welding and cutting is usually supplied in cylinders having a capacity up to about 300 cu. ft. of dissolved acetylene under pressure of 250 psi at 70 deg. F. Acetylene cylinders should be completely filled with an approved porous material impregnated with acetone, the acetylene solvent.

Compressed-gas containers when first put into use are safe for the purpose for which they were designed. However, serious accidents may result from their misuse, abuse, or mishandling. Observance of the following rules will help con-

trol hazards in the handling of these cylinders.

1. Do not remove or change numbers or marks stamped on cylinders.
2. Because of their shape, smooth surface, and weight, cylinders are difficult to carry by hand. When cylinders must be moved without the aid of a truck or other mechanical means, use some type of carrying device. Cylinders may be rolled on the bottom edge but never dragged. (The Section 14 pamphlet contains sketches of safe carrying devices).
3. Protect cylinders from cuts or abrasions on the surface of the metal.
4. Do not lift compressed gas cylinders with an electric magnet. Where cylinders must be handled by a crane or derrick, as on construction jobs, carry them in a cradle or similar device and take extreme care that they are not dropped. Do not use slings.
5. Do not drop cylinders nor permit them to strike each other violently.
6. Do not use cylinders, whether full or empty, for rollers, supports, or any purpose other than to contain gas.
7. Do not tamper with safety devices on valves or cylinders.
8. When empty cylinders are to be returned to the vendor, mark them EMPTY or MT. Close the valves and replace the valve-protection caps.
9. Load or stow cylinders to be trans-

ported so as to allow as little movement as possible. Secure them to prevent violent contact or upsetting.

10. Always consider cylinders as full and handle them with corresponding care. Accidents have resulted when containers under partial pressure were thought to be empty.

The fusible safety plugs on acetylene cylinders melt at about the boiling point of water. If an outlet valve becomes clogged with ice or frozen, it should be thawed with warm (not boiling) water, applied only to the valve. A flame should never be used.

Cylinders should be stored in a safe, dry, well-ventilated place prepared and reserved for the purpose. Flammable substances, such as oil and volatile liquids, should not be stored in the same area. Cylinders should not be stored near elevators, gangways, stairwells, or other places where they can be knocked down or damaged.

Cylinders of oxygen, when stored indoors, should be separated by a fire resistant partition from cylinders containing flammable gases.

Acetylene should be stored and used with the valve end up. For storage in excess of 200 cu. ft. total gas capacity, a separate room or compartment should be provided. Such a room should have no other occupancy, except that it may also be used for storage of calcium carbide.

Cylinders should be stored on a level, fireproof floor. One common type of storage house consists of a shed roof with side walls extending approximately halfway down from the roof and a dividing wall between one kind of gas and another.

To prevent rusting, cylinders stored in the open should be protected against extremes of weather

and from contact with the ground. They should be protected against accumulations of ice and snow in winter and should be screened against continuous direct rays of the sun in summer.

A direct flame or electric arc should never be permitted to come into contact with any part of a compressed gas cylinder.

Storage rooms for cylinders containing flammable gases should be well ventilated to prevent the accumulation of explosive concentrations of gas. No source of ignition should be permitted. Smoking should be prohibited. Wiring should be in conduit.

Electric lights should be in fixed position and enclosed in glass or other transparent material to prevent gas from coming in contact with lighted sockets or lamps, and should be equipped with guards to prevent breakage. Electric switches should be located outside the room.

To avoid confusion, full cylinders and empty cylinders should be stored in different groups, rooms, or buildings. It is preferable to group cylinders having the same contents.

In the use of compressed gas, the cylinders entail considerable handling. The following procedures are sound:

1. Use cylinders, particularly those containing acetylene, in an upright position and secure them against accidentally being knocked over.

2. Whether or not the valve on a cylinder is protected by a recess in the head, keep the metal cap in place to protect the valve when the cylinder is not connected for use. A blow on an unprotected valve might cause gas under high pressure to escape.

3. Make sure the threads on a regulator or union correspond with those on the

cylinder valve outlet. Do not force connections that do not fit.

4. Open cylinder valves slowly. A cylinder not provided with a hand wheel valve should have a spindle key on the valve spindle or stem while the cylinder is in service.

5. To open cylinder valves not provided with hand wheels, use special wrenches or other tools provided or approved by the gas supplier.

6. Do not use a cylinder of compressed gas without reducing the pressure through a regulator attached to the cylinder valve.

7. Before making connection to a cylinder valve outlet, "crack" the valve for an instant to clear the opening of particles of dust or dirt. Always point the valve and opening away from the body and not toward anyone else.

8. Use regulators and pressure gauges only with gases for which they are designed and intended. Do not attempt to repair or alter cylinders, valves, or attachments. This work should be done only by the manufacturer.

9. Unless the cylinder valve has first been closed tightly, do not attempt to stop a leak between the cylinder and the regulator by tightening the adjusting valve.

10. Do not permit sparks, molten metal, electric currents, excessive heat or flames to come in contact with the cylinder or attachments.

11. Never use oil or grease as a lubricant on valves or attachments of oxygen cylinders. Keep oxygen cylinders and fittings away from oil and grease, and do not handle such cylinders or apparatus with oily hands, gloves or clothing.

12. Never use oxygen as a substitute for compressed air in pneumatic tools, in oil preheating burners, to start internal combustion engines, or to dust clothing. Use it only for the purpose for which it is intended.

Instructions for the safe handling of other equipment used in gas welding and cutting are also contained in the reprint of Section 14 of our Accident Prevention Manual.

pair or maintenance operations, or because of leakage; and (3) breakdown, or faulty operation, of equipment or processes, which might release hazardous concentrations of flammable gases, or vapors, might also cause simultaneous failure of electrical equipment.

### **Pump Rooms Not "Hazardous"**

By C. M. PARK  
Engineer, Mill Mutual Fire Prevention  
Bureau, Chicago

Section 5004 of the National Electrical Code defines Class I hazardous locations as those in

## **Fire Hazards at Diesel Fuel Facilities**

To what extent, if any, do diesel oil-pumping stations require explosion proof motors, switches and vapor-proof lights? \*

### **Use Explosion-Proof Motors**

By B. W. DEGEER  
Engineer, Water Service & Fuel Facilities,  
Great Northern, St. Paul, Minn.

We have always installed explosion-proof electrical equipment for use in diesel oil service, as required under Chapter 500, Class I—Group

D—Vol. V, of the 1951 National Electric Code. Group D includes atmospheres containing gasoline, petroleum, naphtha, alcohols, acetone, lacquer solvents, and natural gas.

Class I locations are those in which: (1) Hazardous concentrations of flammable gases, or vapors, exist continuously, intermittently, or periodically under normal operating conditions; (2) hazardous concentration of such gases, or vapors, may exist frequently because of re-

\* Another answer to this question was received from W. S. Wicker, chief engineer, Transportation Mutual Insurance Company. Because of its scope and comprehensiveness, Mr. Wicker's discussion will appear as a feature article in a subsequent issue.

which flammable gases or vapors may be present in dangerous quantities. Section 5151 of Article 510 refers to bulk storage plants handling gasoline or other volatile liquids with similar hazards. It should be noted that reference in both of these sections is to vapors, gases, or volatile liquids.

Diesel oil which usually has a flash point of 150 deg. F. or higher is not usually classed as a volatile

liquid, and would not be expected to give off flammable concentrations of vapors unless it were heated above its flash point. At ordinary temperatures, it would be my conclusion that diesel oil would not be classed as a volatile flammable liquid, and consequently would not introduce a hazardous atmospheric condition in a pump room. This would mean that such a pump room would not ordinarily

be classed as hazardous, and the Electrical Code requirements for hazardous locations would not apply.

In Article 500 of the code, Section 5001 delegates the responsibility for classification of hazardous locations to the authority enforcing the code. Inasmuch as I would not be that authority in this case, the opinions expressed above are purely personal.

## Burrs on Bolt Holes and Rail Ends

To what extent is it desirable to buff the bolt holes, as well as the ends, of new rails to remove stress-raising burrs? How effective is this practice in reducing rail failures within the limits of the joint bars? Explain.

### Research Studies Under Way

By G. M. MAGEE

Research Engineer, Engineering Division,  
Association of American Railroads,  
Chicago

We have a research project on our schedule this year for laboratory fatigue studies of specimens cut from rail webs containing bolt holes. From these studies we expect: (1) To determine the effect of burrs and gouges on the development of fatigue cracks at the bolt hole; and (2) to evaluate the benefits, if any, of certain finishing techniques, such as peening, grinding

or chamfering the bolt hole edges.

Until this work is complete we cannot say authoritatively just how serious the effect of burrs in the edges of bolt holes may actually be.

### Effective in Reducing Breaks

By RAY MCBRIAN

Engineer Standards & Research, Denver  
& Rio Grande Western, Denver, Colo.

Any sharp edge left around the outside edge of bolt holes acts the same as if a notch were present,

and permits the development of stress-fatigue and corrosion-fatigue cracks. Where rails are in road crossings or tunnels or where humidity is high, these corrosion-fatigue cracks can develop rapidly and result in bolt-hole breaks through the rail.

The buffing or removal of the sharp edges reduces the possibility of stress concentration which develops to the greatest degree at a sharp angular edge. In turn this reduction of stress concentration minimizes the possibility of the development of a fatigue or corrosion-fatigue crack. Failures are then prevented from developing when the edges are removed.

This same sequence of failure is true for sharp edges left at the rail ends, especially in the fillet areas. Buffing or removal of sharp edges is very effective in reducing rail-end fatigue breaks.

## Assignment of B. & B. Power Tools

To assure economical and effective work, what mechanized tools and equipment should be assigned permanently to local bridge and building maintenance crews? Explain.

### Each Gang Requires Study

By FRANZ M. MISCH

General B. & B. Supervisor, Southern Pacific, San Francisco, Cal.

Mechanized tools and equipment for economical and effective work should be assigned to B. & B. maintenance crews by taking into consideration the size of the crew and the work to be done. Do not make the mistake of equipping a house gang with tools suitable only for timber bridge construction or a bridge gang with house tools. If a gang works on all types of construction, a greater variety of tools will be required.

The most important item of equipment is the power plant, be-

cause on the majority of railroad jobs, electric current or compressed air is not available at the site. This plant should be light and portable when used with a small gang and should have sufficient capacity to operate all power tools which might be in use at a particular time. Intermittent use of tools and additional capacity obtained from an auxiliary receiver will permit the use of a smaller power plant but loss of efficiency is very apparent when the plant is too low in capacity.

To obviate mistakes in equipping a gang, normal consumption of air or electricity of all power tools should be known. With the knowledge of the consumption of individ-

dual tools and the capacity of the power plant available, it is easy to determine the number of tools that can be used.

In building work, light portable tools will provide the best efficiency. Power saws and drills are necessary equipment and should be of a capacity and size to frame the type of material being used. Prefabrication with shop tools can also provide further economy and efficiency.

Bridge work is a big field and job tool design requires considerable study and some experimenting before the desired effectiveness can be obtained. The personal equation is also in evidence in regard to likes and dislikes of particular types of power and tools. Each have advantages and disadvantages. The question of air-powered tools versus electric tools causes many arguments. However each has its place in equipping bridge and building gangs.

The question refers specifically to permanent tools. The need for permanency should not be overlooked. When essential power tools are assigned to a gang, they should remain there and be available when necessary. Mechanics do not learn to use these tools efficiently without experience. Once acquainted with their use, the efficiency of an entire gang is increased many times, but moving a complement of equipment from gang to gang will not build up over-all efficiency. Good maintenance of this equipment is quite essential but it can be provided only in gang-assigned tools.

In determining the number and types of mechanized tools for a bridge gang working on timber construction it is also necessary to review the size of the gang to be employed and the magnitude of the job. For example, maximum efficiency in regard to tool use and job progress has been obtained in the following examples.

An eight-man B&B. gang was equipped with a 2½-kw, high-cycle generator, a 24-in. chain saw, an impact wrench, a ¾-in. reversible electric drill and an 8-in. circular saw. On a recent trestle job this gang showed excellent man-hour savings in comparison with similar work performed manually. The power plant was easily portable and was moved for use throughout the length of the trestle. This group of equipment has proved to be one of the lightest and most highly portable of any we have used. It is also extremely adaptable to emergency use since it can be transported by auto and because it can be employed to provide floodlights for night use.

For heavier construction and a larger gang the use of air tools has been found more economical. A gang of 14 men was furnished with a 210-cu. ft. compressor, a push-car crane with air hoist, four ¾-in. air drills, two ¾-in. impact wrenches, a 24-in. chain saw, a 12-in. circular saw, and two spike drivers. With intermittent use of these tools, a 105-cu. ft. compressor would no doubt have been satisfactory, but any smaller compressor would not have satisfactorily operated the chain saw. In addition a 2½-in. pipe line with service connections was provided to decrease transmission loss attributable to long lengths of air hose. Total man-hour production was consequently found to be very satisfactory.

The furnishing of an air compressor on a large job also makes possible the use of various pneumatic

tools such as spike drivers, air hoists, paving breakers, jackhammers and riveters. As a rule it has been found that air tools are more rugged and will take more abuse and will work in all kinds of exposure, even when submerged under water. Pneumatic tools are generally of lighter weight than electric tools and are not susceptible to damage from overloading, stalling and other hazards of rough use. However, when the question of the portability of tools is considered, the weight and cost of a suitable compressor can by no means be disregarded.

Thus the power-tool needs of each gang should be studied to the end that each can be suitably equipped for the work assigned. Economy and efficiency depend on providing for each job the tools that will do the work better with fewer man-hours of labor than are necessary with hand tools.

The cost of mechanized tools and equipment is only a small percentage of the over-all savings in man-hours. Power tools make the work easier for the men who are the builders, and their satisfaction in the ease with which the job can be done well means much intangible savings to our railroads.

#### Lists Minimum Tools

By A. E. BURFORD

General Foreman, Bridges and Buildings,  
Illinois Central, Memphis, Tenn.

The question of what mechanized tools to assign permanently to bridge and building maintenance crews is one in which I am vitally interested. To operate economically and efficiently each crew should have one 105-cu. ft. air compressor, two Ingersoll-Rand No. 534 (or similar), impact wrenches, one air auger, one pneumatic chain saw, a motor car similar to the Fairmont A-3, two push cars and one push-car derrick. Crews located in large



terminals or those having jurisdiction over the maintenance of shop buildings and enginehouses, should also have a paving breaker and one concrete drill.

I have selected the 105-cu. ft. air compressor so that impact wrenches and air augers can be used at the same time if necessary. I also find that an air compressor of at least this size, is needed to give sufficient air for a chain saw to perform efficiently.

The No. 534 impact wrench is desired because I have found that the lighter, No. 519 wrench will not remove nuts from corroded bolts in old bridges whereas the heavier wrench will.

#### Pool Most Power Tools

By H. M. HARLOW

Assistant General Supervisor, Bridges and Buildings, Chesapeake & Ohio, Richmond, Va.

Because of the large investment required to equip each force with complete equipment for any type of job, the most economical way of equipping the forces on a division or any given territory is to handle most equipment from a pool, shifting from force to force as job requirements develop.

Such equipment as motor cars, trucks, lighting plants for living quarters and all such equipment used for housing and transporting the forces, should necessarily be permanently assigned to individual forces, unless special conditions develop.

If forces are specialized, equipment for the type of work done should be permanently assigned. For example, steel-repair gangs should be assigned an air compressor, rivet busters, riveting hammers, miscellaneous riveting equipment and welding equipment.

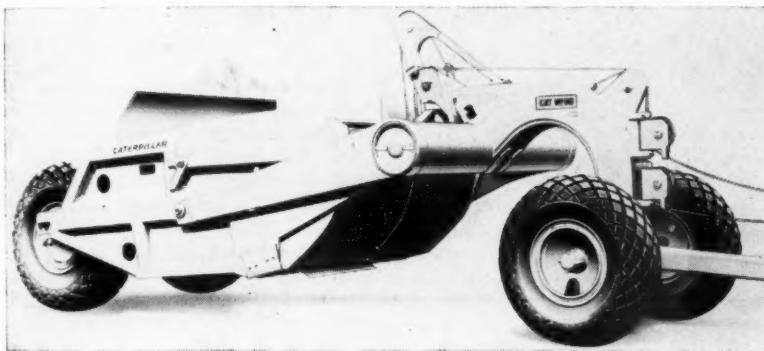
On the other hand, it is more economical to hold in a centralized location such equipment as water pumps, concrete mixers, concrete breakers, rock drills, portable power saws, cranes of all types, most power hand tools, grouting equipment and any equipment that will be useful only on certain types of work. Idleness of work equipment represents inefficient use of an investment and for that reason ready availability, as and when needed, is very important. To see that equipment which can be economically used on a job is used, is the responsibility of the supervisor.

# PRODUCTS OF MANUFACTURERS

New, improved equipment, materials, devices



(For additional information on any of the products described in these columns, use postcards, page 655)



## NEW SCRAPER FOR USE WITH TRACTOR

A NEW No. 60 scraper for use with D6 crawler scrapers has recently been announced by the Caterpillar Tractor Company, Peoria, Ill. The new unit has a flat-bottom bowl and stinger blade engineered for loading and finishing characteristics. The reversible blade cuts a 7-ft. 8-in. swath; the bottom is double with steel beam fillers. Capacity of the No. 60 has been in-

creased to 7 cu. yd. struck and 9 cu. yd. heaped. Top extensions or sideboards are available to boost this capacity to 8.3 cu. yd. struck and 11.5 cu. yd. heaped. Maximum carrying capacity is 11.5 tons. Also included are such design details as an unobstructed bowl, tapered roller bearings at the axles, induction hardened sheaves and bulldozer-type ejection. Operation is by means of a Cat Cable Control available for attachment to the D6 crawler tractor.

## REPAIR KIT FOR OXYACETYLENE HOSES

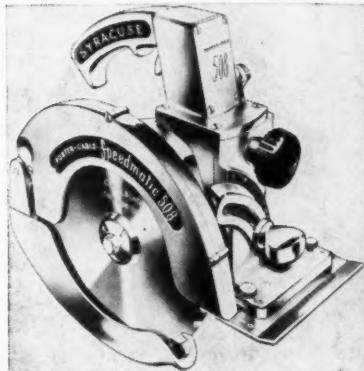
GAS Arc Supply, Philadelphia, Pa., has recently introduced a new kit for on-the-job repair of cutting and welding hose. The "Fast Fix" kit, as it is known, is complete with all necessary tools and replacement parts for (1) putting a new nipple-ferrule-nut assembly on the end of a length of hose, (2) permanently splicing two lengths of hose, and (3) temporarily coupling two sections of hose. The kit is packaged in a heavy-gauge, tinned steel, compartmented box with complete instructions. Repair parts, for  $\frac{1}{4}$ -in. or  $\frac{3}{16}$ -in. oxygen or acetylene hose, include nipples, nuts and ferrules, double-ended splicing nipples, and threaded coupling sections. All nuts, nipples and couplers are solid brass,



while ferrules are either brass or aluminum. Also included in the kit are two E-Z Way hose ferrule crimping tools, one for  $\frac{1}{4}$ -in. inside diameter hose, and one for  $\frac{3}{16}$ -in. inside diameter hose.

## NEW ELECTRIC SAW FOR SAFER OPERATION

THE Porter-Cable Machine Company, Syracuse, N. Y., has announced the availability of two new Speedmatic electric hand saws. These saws, designated as Models 507 and 508, feature "kickproof" clutches which allow the motor to turn while the blade remains stationary due to binding or striking knots. Both saws are equipped with depth adjustments, which can be set accurately in a few seconds, and



improved safety guards, which need not be removed for blade changing.

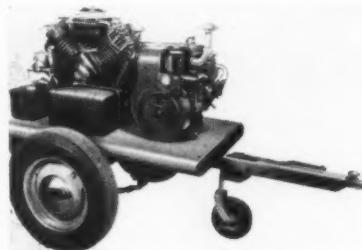
Model 507 has a  $7\frac{1}{2}$ -in. blade and cuts to a maximum depth of  $2\frac{1}{2}$  in., at 90 deg. and to  $1\frac{27}{32}$  in. at 45 deg., and weighs 15 lb. Featuring an 8-in. blade, Model 508 will cut to a depth of  $2\frac{1}{2}$  in., at 90 deg., and to 2 in. at 45 deg. Net weight of the Model 508 is 17 lb. Standard equipment for both the saws includes a 10-ft. cord and plug, one combination blade, metal carrying case, double-end wrench, rip gauge and a tube of grease. Accessory equipment available for both models includes a cross-cut gauge; special blades for Masonite, plywood, and light non-ferrous metals; ripping blades; planer blades; combination blades; and abrasive discs for scoring tile, stone, asbestos, and metal.

For additional information on any of the products described on these pages, use postcards, page 655.

## AIR COMPRESSORS FEATURE PORTABILITY

THE DeVilbiss Company, Toledo, Ohio, has recently announced the availability of a new line of portable air compressors. Each compressor is mounted on a two-wheeled trailer with a standard hitch for towing behind a car or truck. They can also be obtained with skid mountings for use where great mobility is not required or if it is desired to mount them in truck bodies. The compressors are manufactured in three sizes to deliver 21, 35 or 50 cu. ft. of air per minute. They are of the V-type, 4-cylinder, 2-stage type. Among the outstanding features of the compressors are trouble-free valves,

forged-steel crankshafts, balanced and precision-ground ball-type main bearings, and automotive insert-type rod bearings. The compressors have automatic oiling to all parts. Cooling is accomplished through finned heads, cylinders and inter and after coolers. They have



automatic unloaders, and are driven by heavy-duty, industrial-type air-cooled gasoline engines. The engines are available with either electric or magnetic starting systems. The 35 and 50 c.f.m. com-

pressors are equipped with governors for automatically slowing down the engine while the compressor is unloading.

The chassis of each unit also serves as a gasoline tank and is equipped with a drain for accumulated moisture. The 35 and 50-c.f.m. trailer models have large leaf-type springs. Taper roller wheel bearings are used and the tires are 6.00 by 16. A retractable caster-type rubber-tired front wheel is used to stabilize the compressor while in operation. The 21 c.f.m. model has a rubber padded leg to keep the compressor level during operation. The 35 and 50 c.f.m. compressors are also available with enclosures which protect them against weather and tampering. The steel panel enclosure is securely attached to the frame and completely covers the engine and compressor. The compressor may be operated without removal of the enclosure, which has hinged side panels.



## NEW WOOLERY SPIKE DRIVER

A NEW spike-driving machine has been added to the line of portable lightweight on-track machines produced by the Woolery Machine Company, Minneapolis, Minn. It carries a 50-gal. air-storage tank, a 30-c.f.m. air compressor powered by a single-cylinder 8-hp. Briggs & Stratton gasoline engine, and a pneumatic spike hammer—all mounted on an all-welded undercarriage of tubing and angle iron.

It is manually propelled on four small flanged wheels with roller bearings and can be stopped quickly by pulling back on the push handle which applies brakes to two of the wheels. When pressure is applied to the push handle, as when pushing the machine forward, the brakes are released, and, when the push handle is released, as when unattended, a spring action brings the brakes in contact with the wheels.

In addition to the usual safety

valve the compressor is equipped with an automatic unloader valve which prevents accumulation of more than 110 lb. pressure and automatically idles the engine and compressor until the pressure drops to 95 lb. When this point is reached the engine resumes its governed speed.

The hammer is a medium-weight Thor pneumatic spike driver. It is carried in a holder on the machine when not in use, and is connected to the storage tank by a hose about 8 ft. long with a quick-detachable fitting.

Two men—a machine operator and a helper—are required for the operation of the machine. One man holds the spike in a spike-holding tool while the other operates the hammer. The machine is also equipped with two 8-in. by 4-in. pneumatic set-off wheels on one side of the unit. These wheels can be locked in the "up" position while the machine is operating and in the "down" position when setting it off. Two handles on the opposite side of the machine enable the two men to remove the unit, which has a total weight of 580 lb. The lifting weight is 210 lb.

From the experience gained thus far with this new machine, the manufacturer contemplates relocating the compressor, engine and storage tank on the frame to take part of this weight from the lifting handles and apportion it to the set-off wheels.

For additional information on any of the products described on these pages, use postcards, page 655.

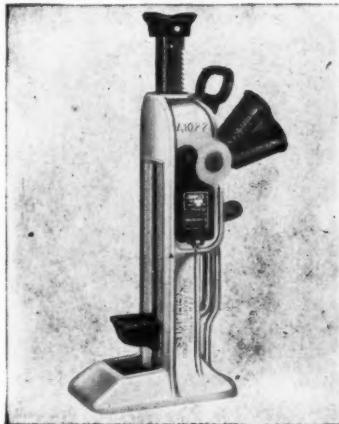
## NEW ONE-COAT MASONRY COATING

INTRODUCTION of a new one-coat masonry paint has been announced by United Laboratories, Inc., Cleveland, Ohio. Called Mason-Coat No. 310, the product is an oil-base paint designed for the two-fold duty of decoration and protection against moisture infiltration. It is applicable to both interior and exterior surfaces of concrete block, cement, brick, stucco, asbestos-cement siding and other similar masonry surfaces. Mason-Coat may be applied by brush or spray over either new masonry or surfaces that have been previously painted. The manufacturer claims that since the paint is extremely elastic, it will withstand severe weather and temperature changes. Mason-Coat is very heavy in consistency but brushes out with ease and is available in white and several tints.

## LIGHT-WEIGHT JACK HAS ALUMINUM HOUSING

A NEW lightweight ratchet-lowering lever jack with an aluminum housing has been announced by Templeton, Kenly & Co., Chicago. Known as the Simplex A1022, the jack has a capacity of 10 tons and weighs 42 lb. It is designed to

satisfy demands for lightweight versatility in a wide range of general purpose industrial, construction, oil field and railroad uses. The jack has a minimum height of 20½



in., a 12-in. lift and a broad toe lift with a minimum height of 2 in. The toe lifts the full rated capacity of the jack. The A1022 incorporates other features of the Simplex line, including drop forged and machined alloy steel operating parts, double-lever sockets, cadmium-plated springs and links, multiple-toothed pawls, lubricated bearings and shorter fulcrum centers.

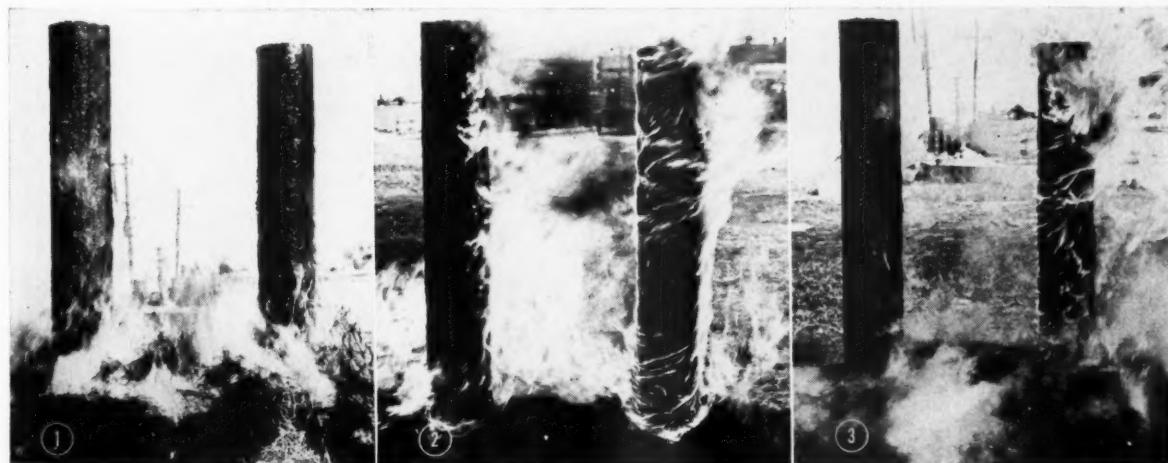
## NEW NUT HAS LOCKING INSERT

THE Security Locknut Corporation, Melrose Park, Ill., has announced a complete line of square nuts for use in track work, bridge construc-

tion and other railway applications. This nut, known as the Security Railoc, is similar in design to the present square nut being used by railways in track work, but it includes the Security locking insert which is said to provide a tight hold when in use. The manufacturer claims that the Security Railoc will remain tight in any position on the bolt and will not back off in service and can be removed and re-used any number of times on the same bolt without destroying or distorting the bolt threads in any manner.

## SHATTER-PROOF TRANSLUCENT PLASTIC

THE Plexolite Corporation, Los Angeles, Cal., has announced that Plexolite, a translucent fiber-glass-reinforced plastic, is now in full production. This material is available in corrugated and flat sheets up to 12 ft. in length, and conforms in width to standard roofing and siding. Plexolite applications include window openings, sky lights, garage doors and partitions. It is said to be shatterproof and to possess high structural strength, as well as being inert to the effects of alkaline fumes, moisture and mild acids. It is manufactured in three thicknesses:  $\frac{1}{16}$ ,  $\frac{1}{8}$ , and  $\frac{1}{4}$  in.; and can be worked with ordinary tools. It is claimed that it can be worked with ordinary tools. Plexolite is available in 12 colors including coral, yellow, green, blue and ivory, and several others.



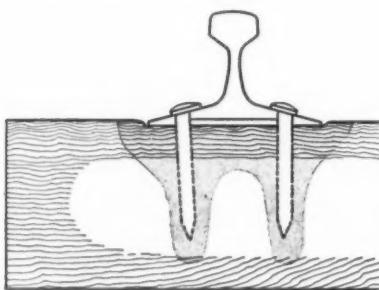
IN THIS TEST, conducted by the Zone Company, Ft. Worth, Tex., the timber at the left was coated with Zone Fireplate (R&M, May, p. 504), while the timber at the right was treated with a bituminous material. In the first picture, straw has been

ignited at the base of the timbers. Four minutes later, the fire rages about both timbers (2). However, in photo No. 3, gases issued by the Fireplate compound have extinguished the blaze, while the timber at the right burns briskly

For additional information on any of the products described on these pages, use postcards, page 655.

### TIE PRESERVATIVE EMPLOYS OSMOSIS

OSMOPLASTIC, a wood-preservative composed essentially of sodium fluoride, dinitrophenol, and potassium bichromate suspended in a gelatinous coal-tar base, said to be particularly adaptable to tie preservation, has been introduced by the Osmose Wood Preserving Company, Buffalo, N. Y. This compound is recommended especially for spot application to such vulnerable areas in creosoted members as adzed or readzed surfaces of ties, tie ends, timber joints, etc. It can be applied either by hand with a long-handled brush, or with mechanical pouring devices, without preheating, at tem-



The shaded area shows the region which has been penetrated by the Osmoplastic

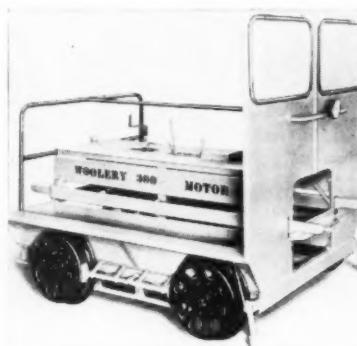
peratures as low as 10 deg. F.

The toxic chemicals in Osmoplastic are claimed to penetrate the wood both vertically and laterally by osmosis to achieve penetration through spike and bolt holes, checks, and abrasions to areas of the wood that lie below area of penetration of the creosote. Because of the coal-tar content of the mixture, it is also said to prevent the entrance of moisture to the wood fibers.

### IMPROVED MOTOR CARS

THE Woolery Machine Company, Minneapolis, Minn., has recently announced that several major improvements have been incorporated in the Woolery Model 300 motor car. The improved car is driven by a 13-hp. Wisconsin gasoline engine and features 16-in. steel wheels; steel sides; standard A.R.E.A. parts; and is available in different lengths to accommodate 6, 8 or 10 men.

The car is equipped with a four-wheel drive and a selective differential. Other standard features such as light weight, wide-vision windshield, and several accessories, incorporated in previous models, have been employed in the improved design.



Also available is the Model 310 motor car which incorporates all the features of the improved Model 300, but which has a two-wheel drive.

### SAFETY AIR HOSE HAS BUILT-IN PROTECTION

A SAFETY air hose for use on concrete busters, breakers, jack hammers and similar pneumatic equipment, which is designed to prevent accidents and possible fatalities



caused by coming in contact with hidden power lines, has been developed by the Mercer Rubber Corporation, New York. Mercer's Invincible Safety Air Hose has its protection built right into it with a braided copper ribbon of 832 strands that forms a high current-carrying medium which is securely bonded in the actual carcass of the oil-proof, abrasion and heat-resistant hose.

## What Our Readers Think

### HAS FAST METHOD OF STAKING CURVES

Cleveland, Ohio

To the Editor:

The article in your April issue entitled "How One Road Has Mechanized Its Stringing Work" describes what may be a step in mechanical progress, but it indicates a void in our engineering education. Are we willing to forego education for a machine, judgment for manipulation?

A method is known by which results comparable in every way, if not superior to those obtained with the "Curveliner," can be attained. With proper training, an engineer can acquire within a very short time, the necessary know-how and judgment to obtain good alignment. It is not necessary to "lug" the heavy calculator or send the notes to the office to be worked out. This is the Bartlett method as refined by M. B. Allen, division engineer, Nickel Plate, Frankfort, Ind.

Considerable saving in time is claimed. Let me cite an experience: A party of three staked a single-track curve, 2,300 ft. long, in one day between 8:00 a.m. and 5:00 p.m., including measurement of track centers to a second main. The method referred to above was used and all computations checked in the field. The Throwmeters appear to have certain advantages, but it is necessary that an engineer be on hand during the lining of the curve. Why tie engineering personnel to a track gang schedule? In the article, this statement is found:

"It was found after a few attempts that the men in the gang were able to throw the track without the foreman's continuous direction, by merely watching the indicator on the meter at each station. This permitted the foremen to devote part of the time to examination of the general alignment and to make minor corrections at intermediate points, when required, before the gang had moved more than several stations beyond."

It would seem that the engineer should control the alignment.

WALTER E. WEBB  
Assistant Designing Engineer  
Nickel Plate

# "Bill" . . . "OUR COSTS ON MOWING ARE SKYROCKETING!"

*"A way must be found to cut these costs because with the high water we recently had, everything is growing in a big way."*

ENG. M. of W.

"You're telling me. The time it takes our men to do mowing these days makes me boil all over."

"Looks to me as though mowing is in any case, a practice of the past. I watched the work on the C.P.&L. last summer and fall. Looks to me as though chemical is the answer."

CH. ENG.

ENG. M. of W.

*"What outfit did the work?"*

"READE has done their weed killing work as long as I can remember. Now they use chemical to replace mowing. The stuff they use seems to kill or blight the top growth and it was well into fall before the top growth got under way. Looks as though the roots are purposely preserved. Anyway, it did the trick and eliminated mowing completely."

CH. ENG.

ENG. M. of W.

*"What about the heavy stuff?"*

"Well, the same crew, when the weed killing work was completed, came along with another chemical and sprayed the brush. I watched results last fall and they looked good. And I have been studying them this spring to see what benefits carry over into the second growing season. I would say that new growth is perhaps 25-30% of the growing of early 1951."

"Looks to me boss, as though this is the answer to our problem. Why not get in touch with READE?"

CH. ENG.

*"Let's do that—maybe we can get on their spraying schedule promptly. You get the dope, and let me have a look at it when it's all lined up."*



# THE MONTH'S NEWS

Happenings among the railways — the associations — the suppliers



## Changes in Railway Personnel

### General

**David Wetterau**, supervisor of track on the Southern, has been appointed assistant trainmaster, with headquarters as before at Selma, Ala.

**Merritt Rose**, supervisor of maintenance of way on the Aliquippa & Southern, has been appointed assistant superintendent.

**Bernard S. Sines**, former president of the Southern Pacific of Mexico, and an engineer by training and experience, has been appointed vice-president of the Texas & New Orleans at Houston, Tex.

Mr. Sines began his railroad career as a chainman for the Union Pacific in 1921. He then served as instrumentman for the Illinois Central, joining the Southern

hanna division, with headquarters at Williamsport, Pa.

**J. M. Campbell**, division engineer on the Canadian Pacific at Lethbridge, Alta., has retired after 44 years of service.

**R. A. Sharood**, chief engineer of the Alaska Railroad, has assumed the position of chief engineer of the government-owned Saudi Arabia Railroad.

**Edwin O. Williams** has been appointed senior assistant division engineer on the Rio Grande division of the Southern Pacific at El Paso, Tex., succeeding **H. C. Stull**, retired.

**J. W. Hughes, Sr.**, assistant to engineer maintenance of way, and formerly general roadmaster, Atlantic Coast Line, Florence, S. C., retired recently after more than 40 years of service.

**D. Collis**, assistant district engineer on the Canadian Pacific at North Bay, Ont., has been appointed division engineer on the Laurentian division, with headquarters at Montreal, Que., to succeed **L. A. Comeau**, who has been transferred.

**C. T. Popma**, supervisor of track on the New York Central at Jackson, Mich., has been promoted to assistant division engineer with headquarters at Cleveland, Ohio, to succeed **C. C. Herrick**, who has been appointed assistant engineer, with headquarters continuing at Cleveland.

**Clarence J. Randall**, whose appointment as assistant division engineer on the New York Central at Watertown, N. Y., was announced recently (R.E.&M., April, p. 416), was born at Cambridge, N. Y., on December 9, 1899. He received his Bachelor of Science degree from Westminster College in 1924, following which he did graduate work at Columbia university. Entering the employ of the New York Central as a rodman on the electric division at New York in January, 1928, Mr. Randall subsequently served as chainman, draftsman and transitman at that location. From June 1939 to July 1940 he was employed in the office of engineer of maintenance of way at New York. On the latter date he was appointed assistant supervisor of track at Newburgh, N. Y., and was later transferred in that capacity to Harmon, N. Y. In February 1946 he was advanced to supervisor of track at Malone, N. Y., the position he held at the time of his recent promotion.

**Howard W. Seeley**, whose appoint-

ment as assistant division engineer on the Pennsylvania at Pittsburgh, Pa., was recently announced (R.E.&M., April, p. 418), was born at Union City, N. J. on April 29, 1913. He received his degree in civil engineering from Lehigh University in 1935, and on July 6 of that year entered the service of the Pennsylvania as an engineering apprentice at Cresson, Pa., subsequently serving as an assistant on the engineering corps at Erie, Pa., Pittsburgh, and Dennison, Ohio. Appointed assistant supervisor of track on March 7, 1937, at Terre Haute, Ind., except for a few months in 1939 when he returned to his former position of assistant on the engineering corps at Fort Wayne, Ind., Mr. Seeley occupied the position of assistant supervisor consecutively at Terre Haute, Lock Haven, Pa., and Coshocton, Ohio, until January 1, 1942. On the latter date he was advanced to supervisor of track at Akron, Ohio, and later served in that capacity at Newcastle, Pa., Columbus, Ohio, and Wilmington, Del.

**Archibald D. Duffie**, whose appointment as designing engineer on the New York Central at New York was recently announced (R.E.&M., May, p. 508), was born at Litchfield, Conn., on April 13, 1892, and received his civil engineering degree from Columbia university in 1913. Entering the service of the New York Central on February 1 1917, as a rodman at Castleton, N. Y., he was promoted to assistant engineer, office of district engineer, Eastern district, in 1918. The following year he was appointed assistant to engineer of grade crossings at New York, and from 1926 to 1932 served as district engineer on the Middle district at Albany, N. Y. In the latter year Mr. Duffie returned to New York as assistant engineer on West Side improvements and other projects, and a year later was transferred to Syracuse, N. Y., as assistant engineer in charge of relocation of line and station improvements, etc., in connection with the elimination of grade crossings. He was appointed assistant to engineer of grade crossings and designing engineer at New York in 1938, and served in that capacity until 1946, when he was appointed assistant designing engineer at New York, the position he held prior to his recent promotion.

**James B. Gregory**, who has been appointed division engineer on the Seaboard Air Line at Raleigh, N. C., (R.E.&M., April, p. 416) was born at Lynchburg, Va., on April 19, 1916, and was graduated in civil engineering from Virginia Military Institute in June 1937. The fol-

(Continued on page 700)



Bernard S. Sines

Pacific in 1925 as an assistant engineer. He was appointed executive assistant in 1937, and subsequently held positions as trainmaster, assistant superintendent, superintendent, and executive representative. In April 1948 he was promoted to vice-president of the subsidiary Southern Pacific of Mexico, becoming president of that line in December of that year, and holding that position until after the road was sold to the government of Mexico in December 1951.

### Engineering

**J. F. Piper**, division engineer on the Pennsylvania at Altoona, Pa., has been appointed superintendent of the Susque-

# **Look at the many advantages multi-purpose Macbeth Spike Anchors have over other types of rail fasteners!**

#### **REDUCES MECHANICAL WEAR:**

4 Macbeth Spike Anchors clamp rails, tie and tie plates solidly together with a force of approximately 4½ tons. No hold down spikes or conventional wear-resistant devices required because *the tie plates can't shift*. Mechanical wear is reduced because there is no relative motion between the tie and tie plates.

#### **REPLACES CONVENTIONAL SPIKE AND ANCHOR:**

Macbeth Spike Anchors drive into the ties through the line spike holes of standard tie plates. *Every* Macbeth is immediately effective when fitted and *stays* that way. They hold the rail with a grip far exceeding the resistance of the ballast...and stop creep *both ways*.

#### **NO MAINTENANCE:**

Macbeth Spike Anchors when properly driven require no maintenance...because *they won't work loose*.

#### **REDUCES IMMEDIATE AND LONG-RANGE COSTS:**

4 Macbeth Spike Anchors per tie do the job of line spikes, hold downs and at least 2 conventional anchors (4 when 2-way holding is needed)...and you don't need wear-resistant devices. Macbeths cut maintenance...and since they reduce wear, your tie renewal costs come down, too.

for facts, figures and comparative costs, write for Bulletin C.



**H. T. KENNEDY COMPANY, INC. • 37 WALL STREET • NEW YORK 5, N. Y.**

INTER-  
CHANGEABILITY  
OF PARTS

for Nos. 117, 117-A, 517-B,  
517-BA, 617 and 217

is another  
**BIG REASON**  
why we like

# Duff-Norton TRACK JACKS

Yes, the interchangeability of parts is another outstanding reason why Duff-Norton Track Jacks are so popular among track maintenance men. Only a minimum of spare parts is needed for all jacks in service. This, coupled with "built-in" dependability, makes Duff-Norton jacks unexcelled for all track surfacing, lining and tamping operations.

*Write for Bulletin AD-18 Q.*

THE **DUFF-NORTON** MANUFACTURING CO.

MAIN PLANT and GENERAL OFFICES, PITTSBURGH 30, PA.—CANADIAN PLANT, TORONTO 6, ONT.

*"The House that Jacks Built"*



## Railway Personnel (Cont'd)

lowing month he entered the service of the Seaboard as an apprentice track foreman at Jacksonville, Fla. Appointed assistant to division engineer at Atlanta, Ga., on May 1, 1939, he subsequently served in that capacity at Raleigh until April 1, 1941, when he was advanced to assistant division engineer at that location. Mr. Gregory served as a major in the corps of Engineers, U. S. Army, from No-



James B. Gregory

ember 16, 1941, until March 1, 1946, when he returned to his former position at Raleigh. On May 16, 1946, he was appointed assistant supervisor of work equipment at Hamlet, N. C., and on November 1, 1948, was advanced to senior assistant division engineer at Raleigh, the position he held at the time of his recent promotion.

B. J. Crosland, assistant chief engineer for the Frisco's Eastern district, has been named assistant chief engineer for the entire system. F. E. Short, assistant chief engineer for the Western district, has been appointed division engineer on the Northern division at Ft. Scott, Kan. Frank N. Beighley, division engineer, Northern division, has been named to the newly created position of roadway engineer at Springfield, Mo.

After serving with the Army Engineers in World War I, Mr. Crosland came to the Frisco as a transitman, field assistant



B. J. Crosland

engineer, in 1920. He later held the positions of roadmaster at the Kansas City Terminal and on the Afton subdivision, assistant division engineer and division engineer at Ft. Scott. After serving four years as a Colonel in the Army Engineers in World War II, he returned to the Frisco in 1946, and has since held the positions of assistant chief engineer on the Western and Eastern districts.

Mr. Beighley began his Frisco career in September 1929 as a rodman at Ft. Scott. He was made assistant engineer



Frank N. Beighley

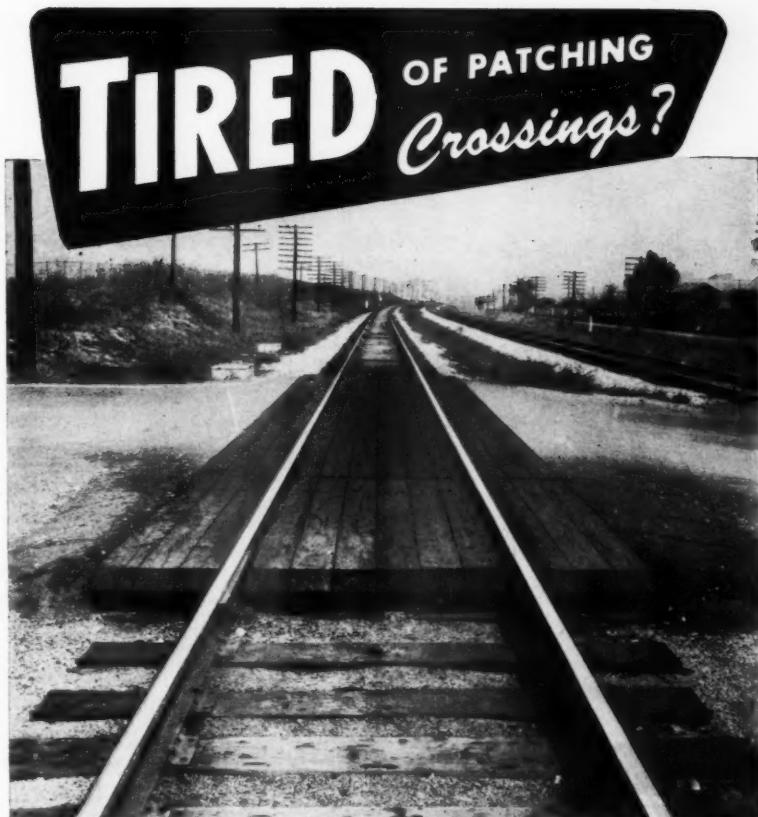
there in June 1936, and served as acting division engineer from April 1942 until October of that year. He was named roadmaster at Kansas City in October 1942, and was appointed division engineer on the Northern division in August 1947.

Charles G. Grove, chief engineer maintenance of way of the Western region of the Pennsylvania, has been appointed chief engineer with headquarters as before in Chicago, succeeding J. D. Moffat, who has retired. Donald E. Rudisill, assistant chief engineer maintenance of way of the Central region succeeds Mr. Grove. Glen A. Williams, engineer maintenance of way of the Central region, has been promoted to assistant chief engineer maintenance of way, Central region, succeeding Mr. Rudisill, and J. W. Wallenius, assistant superintendent of the Chicago division succeeds Mr. Williams.

Mr. Grove was graduated from Pennsylvania State College in 1912, and entered the service of the Pennsylvania that year as a rodman. He held various positions in the maintenance of way department and in 1917 was promoted to assistant supervisor. He was appointed supervisor in 1920 and served at several locations in that capacity, prior to his appointment as division engineer in 1928. He held positions, successively, as superintendent, superintendent of passenger transportation, and engineer maintenance of way. He was appointed chief engineer maintenance of way of the Western region in 1940.

Mr. Moffat was graduated from Washington and Jefferson College in 1904, and entered the service of the Pennsylvania in 1907 as a transitman. He served

(Continued on page 702)



## MOSS *Creosoted Black Gum* CROSSINGS

*are built to last!*

• Tough yet resilient Moss Crossings are constructed of black gum to withstand the constant tortuous pounding of heavy vehicular and railroad traffic. Many Moss Crossings have weathered this daily punishment for more than 15 years with little apparent deterioration. For crossings that are tougher, smoother and longer-lasting with less maintenance, specify Moss Creosoted Black Gum Crossings.



HERE'S WHY YOUR BEST BET IS MOSS CROSSINGS:

- Made of rugged black gum for maximum strength and uniformity.
- Tailored to fit any-angle, any curve.
- Highest quality preservative forced in under pressure, protecting against rot.
- Easily, economically installed.
- Bolted together for tighter fit.
- Full thickness — top of cross tie to top of rail.

### T. J. MOSS TIE COMPANY

700 SECURITY BUILDING • SAINT LOUIS 2, MISSOURI

*Cross Ties • Switch Ties • Lumber • Poles and Posts • Piling • Crossings*

WOOD PRESERVING PLANTS: Mt. Vernon, Ill.; E. St. Louis, Ill.; Granville, Wis.; Shreveport, La.; Columbus, Miss.



New PB-51  
**PAVING BREAKER**

Over 2000 Blows Per Min.



## 100% Self Contained SYNTRON **GASOLINE HAMMERS**

The Syntron PB-51 Paving Breaker's more than 2000 fracturing blows per minute with the explosive energy of gasoline and new, heavy piston that adds 50% more fracturing power to each blow, reduce job-time and job-fatigue; do a better job than laborious hand methods.

### Greater Fracturing Power



Ruggedly constructed to stand rough, severe service — runs cool, not affected by weather.

Simple Design — Permits easy dismantling for cleaning and inspection in a few minutes.

**Low Initial Cost** — 100% Self Contained, Syntron Gasoline Hammers do not require expensive auxiliary power equipment such as air compressor, hose and accessories

**Low Maintenance Cost** — No batteries to run down; no springs to fatigue and break — the striking piston is a free piston actuated by the explosive pressure of gasoline.

**Low Operating Cost** — One man operation . . . easily handled by any one workman . . . no crew necessary — consumes about 2 qts. low test fuel per hour under continuous running.

New RD-51  
**ROCK DRILL**

Drills Rock up to 20' Per Min.



**Easy to Start** — Simple, pull rope starter same as outboard motors . . . dependable — summer or winter.

**Extremely Portable**, compact design and absence of auxiliary power equipment permit car-trunk hauling and one-man operation.

### Faster Drilling Speed

The Syntron RD-51 Rock Drills high torque rotation of the drill bit; plus continuous exhaust gas pressure cleaning of the hole, down to a depth of 18' to 24", provides for fast, easy drilling at rates of up to 20' per minute.



**Write Now For Your Free Copy  
SYNTRON GASOLINE HAMMER CATALOG FOLDER**

**SYNTRON CO.**

290 Lexington Avenue, Homer City, Pa.

## Railway Personnel (Cont'd)

successively as instrumentman, engineer in charge, assistant engineer, assistant to the chief engineer, and in 1943 was appointed chief engineer of the Western region.

Mr. Rudisill, a graduate of Gettysburg College, became a draftsman for the Pennsylvania in 1923, and a short time later was promoted to rodman. He then



Charles G. Grove



J. D. Moffat



Donald E. Rudisill

held positions as assistant supervisor, division engineer, engineer maintenance of way of the Western Pennsylvania division, and in 1947 was advanced to chief

engineer maintenance of way of the New York zone. He was named assistant chief engineer maintenance of way of the Western region in 1949.

### Track

**O. O. Zinsmaster**, supervisor of track on the New York Central as Van Wert, Ohio, retired recently after more than 46 years of service.

**H. G. Talbot**, roadmaster on the Canadian Pacific at Lacombe, Alta., has retired after 34 years of service, and **A. M. Telford**, roadmaster at Orangeville, Ont., has retired after more than 32 years of service.

**L. B. Cann, Jr.** has been appointed supervisor of track on district No. 2 of the Richmond, Fredericksburg & Potowmac at Fredericksburg, Va., succeeding **D. C. Hastings**, transferred. **C. E. Whitmore, Jr.** and **John R. Tabot, Jr.** have been appointed assistant supervisors of track on district No. 1 at Richmond, Va.

**James J. McDaris** section foreman on the Knoxville division of the Southern, has been appointed assistant supervisor of track at Huntsville, Ala.; **Hoyt E. Jones**, assistant extra gang foreman on the Atlanta division, has been appointed assistant supervisor of track at Sheffield, Ala.; **Harold H. Oliver**, extra gang foreman on the Columbia division, has been appointed assistant supervisor of track at Chester, S. C.; **Russell C. Hopkins**, assistant section foreman at Monroe, Va., has been appointed assistant supervisor of track at Culpeper, Va.; **Grady F. Riley, Sr.**, track foreman on the New Orleans & North Eastern, becomes assistant supervisor of track at Picayune, Miss.; **Nelson M. Ayers**, section foreman at Moscow, Tenn., has been appointed assistant supervisor of track at Middleton, Tenn.; **Clarence A. McGee**, section foreman at Appalachia, Va., became assistant supervisor of track at Gate City, Va.; and **Gillas M. Correll**, has been appointed assistant supervisor of track at Birmingham, Ala.

**J. H. Nolf, Jr.**, supervisor of track on the Columbus division of the Pennsylvania at Marion, Ind., has been transferred to the Lake division with headquarters at Akron, Ohio. **A. W. Levergood**, assistant supervisor of track on the Susquehanna division at Northumberland, Pa., has been transferred to the Eastern division at Pittsburgh, Pa. **D. C. Schramm**, junior engineer on the Fort Wayne division, has been promoted to assistant supervisor of track on the Lake division at Cleveland, Ohio, and **C. G. Yund**, junior engineer on the Chicago division, has been advanced to assistant supervisor of track on that division, with headquarters at Colehour, Ind., to succeed **D. C. Rushman**.

**Mitchell H. Montgomery**, whose promotion to supervisor of track on the Central of Georgia at Cedartown, Ga., was recently announced (R.E.&M., March, p. 319), was born at Mauk, Ga., on November 5, 1913. Entering the employ of the Central of Georgia on October 4, (Continued on page 704)

## Railway Personnel (Cont'd)

1944, as a track laborer at Columbus, Ga., he was furloughed the following January for service with the U. S. Army. Upon his release from the army on October 31, 1946, Mr. Montgomery returned to the railroad as a laborer and was promoted to apprentice foreman on April 12, 1948, with headquarters continuing at Columbus. Shortly thereafter he was appointed section foreman at Childersburg, Ala., and on April 1, 1951, was advanced to apprentice supervisor at Columbus, in which capacity he was serving at the time of his recent promotion.

Carl C. Jackson, who was recently promoted to supervisor of track on the Illinois Central at Bluford, Ill., (RE&M, April, p. 420) was born January 27, 1906, at Illinois, Mo. He entered the service of the IC on July 24, 1922, as a section laborer at Herrin, Ill. On April 1, 1928, he was promoted to section foreman at Herrin, and subsequently served at various locations on the St. Louis division as section foreman, extra gang foreman, and general foreman, track.

Jack E. Greene, whose appointment as supervisor of track on the Southern at Charleston, S. C., was recently announced (RE&M, June, p. 608), was born at

Chatham, Va., on April 28, 1924. Entering the employ of the Southern as section laborer at Culpeper, Va., on March 1946, Mr. Greene later served as apprentice foreman and assistant foreman until October 1950, when he was promoted to assistant supervisor of track at Culpeper, the position he held prior to his recent advancement.

## Bridge and Building

Isaiah Vosburgh, bridge and building supervisor on the New York Central at Poughkeepsie, N. Y., retired recently after more than 50 years of service.

## Obituary

John S. Huntoon, retired assistant engineer of bridges on the Michigan Central, died June 16 at the age of 73.

Mr. Huntoon was born May 15, 1879, at Moline, Ill., and received his higher education at the University of Illinois. Upon graduation in 1905, he entered the service of the Burlington as an instrumentman and the following year joined the Michigan Central as a draftsman. From 1907 until 1911 he served as a bridge inspector and in the latter year was promoted to chief bridge inspector. In 1918 he was appointed assistant engineer of bridges, the position he held at the time of his retirement. Mr. Huntoon was active in the American Railway Bridge & Building Association, serving as chairman of various committees between 1922 and 1928, and as president in 1929-1930.

# Announcing an Important New Fire Resistant Product for Railway Application

## POSITIVE FIRE PROTECTION

for Vertical Members and Supports of Railroad Bridges, Trestles and other Structures

Now . . . from the company that developed the famous Libbey-Zone fire resistant process—comes a completely new product—FIREPLATE. This new product is scientifically correct and thoroughly field tested and proved. FIREPLATE serves a dual purpose: 1) provides exceptional protection against drying, rotting and deterioration and 2) assures almost perfect protection against fire damage.

Even when subjected to extremes of heat, FIREPLATE remains stable . . . will not liquify or run. Equally important, FIREPLATE is not subject to deterioration . . . the original application is all that is ever needed. These photos, reproduced below, taken on



March 28, 1952, during a typical FIREPLATE field test, show conclusively the ability of this remarkable new product development to resist fire damage.

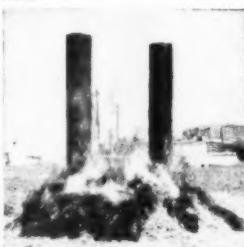
You are invited to get the complete facts about FIREPLATE. Let us arrange a demonstration . . . or send you sufficient FIREPLATE to conduct your own tests if you prefer. Write without obligation.



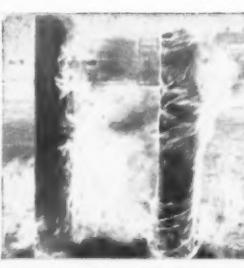
The pole at the left is treated with FIREPLATE: the other pole is treated with a conventional protective coating. Both have been previously creosoted.



Within three minutes after the start of the fire, flames are lapping eagerly at the bases of the two poles.



Seven minutes after the start of the test, the FIREPLATE treated pole clearly shows its ability to resist fire.



Test Concluded. Both poles are shown 16 minutes after the start of the test. The FIREPLATE treatment has prevented any traceable damage to the left pole.



FIREPLATE (Pat. Pending) IS OUR EXCLUSIVE DEVELOPMENT MADE AND SOLD ONLY BY

# THE ZONE COMPANY

Division of the Southwestern Petroleum Company, Box 789, Ft. Worth, Tex.

## Bridge and Building Association

President Martin has called a meeting of the Executive committee to be held at the Chicago Engineers' Club on Monday,

July 21, starting at 9:00 a.m. daylight saving time. In addition to routine business, an important item on the agenda of this meeting will be the reading and review of the technical committee reports to be presented at the convention in September. The chairmen of these committees have been invited to be present at this meeting, and have been requested by president Martin to furnish him with copies of their reports (14 each) on or before July 1, so that they may be reviewed by individual members of the Executive committee in advance of the meeting. Details of the program of the convention, to be held September 15-17 at the Conrad Hilton Hotel, Chicago, will also be discussed at this meeting.

#### Roadmasters' Association

A meeting of the Executive committee will be held at the Engineers' Club, Chicago on July 14. At this meeting the committee will complete its work of reviewing the technical committee reports that will be presented at the coming convention. Four of these reports were reviewed at the last meeting, leaving only two to be dealt with at the July meeting. The Executive committee will also discuss at this meeting the plans that are being

(Continued on page 706)

#### Meetings and Conventions

**American Railway Bridge and Building Association**—Annual meeting, September 15-17, 1952, Conrad Hilton (Stevens) Hotel, Chicago. Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5.

**American Railway Engineering Association**—Annual Meeting, March 17-19, 1953, Chicago. Neal D. Howard, Secretary, 59 E. Van Buren street, Chicago 5.

**American Wood-Preservers' Association**—W. A. Penrose, Secretary-treasurer, 839 Seventeenth street, N. W., Washington 6, D. C.

**Bridge and Building Supply Association**—L. R. Gurley, Secretary, 201 North Wells street, Chicago 6.

**Maintenance of Way Club of Chicago**—Next meeting October 27. E. C. Patterson, Secretary-treasurer, Room 1512, 400 W. Madison street, Chicago 6.

**Metropolitan Maintenance of Way Club**—Secretary, 30 Church street, New York.

**National Railway Appliances Association**—Robert A. Carr, Secretary, 310 South Michigan avenue, Chicago 4; Lewis Thomas, Assistant Secretary, 59 East Van Buren street, Chicago 5.

**Railway Tie Association**—Annual meeting, October 22-24, 1952, Jung Hotel, New Orleans, La. Roy M. Edmonds, Secretary-treasurer, 1221 Locust Street, St. Louis 3, Mo.

**Roadmasters' and Maintenance of Way Association of America**—Annual meeting, September 15-17, 1952, Conrad Hilton (Stevens) Hotel, Chicago. Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5.

**Track Supply Association**—Lewis Thomas, Secretary, 59 E. Van Buren street, Chicago 5.



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(cost conscious)

**More than 100 railroads put their rail testing problems in the hands of Sperry Rail Service to achieve:**

1. Maximum protection through frequent complete testing programs.
2. Lowest possible cost per defect detected, with highest efficiency.



Sperry Detector Cars consistently find more and smaller defects than any other method, and at the lowest possible cost.

Induction Detector Car Service for testing rail in track

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Ultrasonic Detector Car Service for testing rail inside joint bars, at crossings, and in tunnels.

Complete "End to End Testing" Service which assures you that your problems are in the safest hands with

**SPERRY RAIL SERVICE**

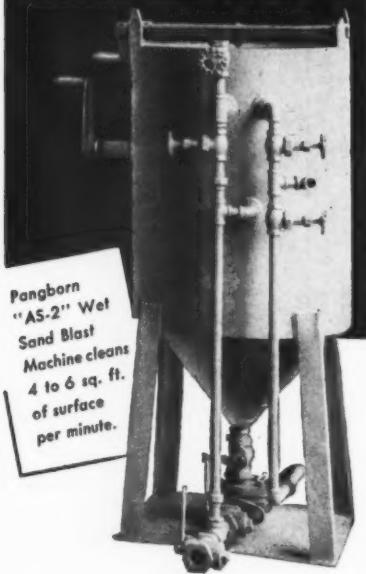
DIVISION OF SPERRY PRODUCTS, INC.

**Danbury Connecticut**

NEW YORK, N.Y. CHICAGO, ILL. ST. LOUIS, MO.

# REMOVE RUST, SCALE

from Water Tanks, Bridges,  
Towers, Steel Freight  
and Tank Cars  
**FASTER AND CHEAPER**



**PANGBORN'S AS-2 Machine** is designed for economical, efficient, outdoor use of wet sand blasting—blast cleaning with a mixture of sand and water! It's inexpensive, practical, test-proven and has these advantages:

*Provides continuous operation*—only necessary to maintain sufficient abrasive supply. *Portable*—with or without two-wheel truck mounting. In addition, tanks are provided with two eye bolts for crane hooks. *Can be used in rainy weather*—unlike dry sand blasting. *Saves money*—eliminates expense of drying sand after purchase; cleans faster and more thoroughly on most surfaces. *Permits use of rust inhibitor*—chemical solutions can be used as an integral part of the cleaning process. *Provides dust-free operation*—prevents damage to nearby machinery and buildings; entirely eliminates need for ventilating systems.

**LEARN HOW YOU** can speed up cleaning and save money at the same time. Write today (at no obligation) for Bulletin No. 116. **PANGBORN CORP.**, 4000 Pangborn Blvd., Hagerstown, Maryland.

Look to Pangborn for the latest developments in Blast Cleaning and Dust Control equipment

# Pangborn

BLAST CLEANS CHEAPER

With the right equipment for every job

## Association News (Cont'd)

made for the annual convention to be held at the Conrad Hilton Hotel, Chicago, September 15-17.

### Metropolitan Maintenance of Way Club

The annual outing of the club was held at the Out O'Bounds Aero & Golf Club, Suffern, N. Y., on June 19. Following past practice the day was devoted to various sports and games, and a buffet luncheon was served.

## Supply Trade News

### General

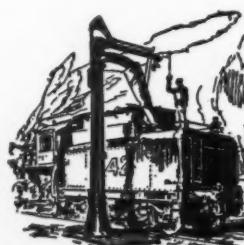
The Reliance division, Eaton Manufacturing Company, Massillon, Ohio, has announced that the firm of Grether & Grether, Stockton, Cal., has been appointed as manufacturer's representative for the company's products in the states of Idaho, Nevada, Arizona, Utah, New Mexico, Wyoming, Colorado, Montana, North and South Dakota, and the city of El Paso, Tex.

**D. W. Onan & Sons, Inc.**, Minneapolis, Minn., has announced three new distributors to handle Onan products in their respective territories. The A. F. Shane Company, Pittsburgh, Pa., will handle sales, service and repair of Onan products in western Pennsylvania. In St. Louis, Mo., the Koochuk Company, Inc., will act as distributor for eastern Missouri and southern Illinois and will continue to provide service facilities. New distributor for Utah and eastern Idaho is the Motor Mercantile Company, Salt Lake City, Utah, a division of the Strevell-Paterson Hardware Company.

### Personal

**William H. Schmidt, Jr.**, western editor of *Railway Age* and vice-president and director of the Simmons-Boardman Publishing Corporation, has been appointed executive editor with headquarters as before at Chicago.

Mr. Schmidt was born on June 28, 1914, at Jersey City, N. J., and received his higher education at Rutgers university,



from which he was graduated with an A.B. degree in 1936. During the summer vacation of that year he served as a laborer in the maintenance department of the Chicago, Milwaukee, St. Paul & Pacific. From 1935 to 1937 he was an instructor in English and in public speaking at Rutgers university. Mr. Schmidt entered the service of *Railway Age* in



William H. Schmidt, Jr.

August 1937 as associate editor. In 1942 he entered the Army, serving with the Quartermaster and Transportation Corps, and rising to the rank of major. In 1946 he was appointed transportation editor of the *Railway Age* and in April 1950 he was promoted to western editor. Mr. Schmidt was named vice-president and director of Simmons-Boardman in May 1951.

**Thomas D. Cartledge** has been appointed president of the Linde Air Products Company, division of the Union Carbide & Carbon Corp., with headquarters at New York. Mr. Cartledge joined Linde as a salesman, and later worked as district manager in Kansas City, Mo., and Dallas, Tex. In 1925 he was transferred to the general sales management staff in



Thomas D. Cartledge

New York and was subsequently appointed manager of gas sales. After holding the positions of assistant general sales manager and general sales manager, he was elected vice-president in 1940. In

1944 he became senior vice-president, director and a member of the executive committee, the positions he held prior to his recent appointment.

**W. B. Lawrence**, general manager of the Cummins Diesel Sales Corporation, has been elected a vice-president of the corporation, with headquarters as before at Columbus, Ind. Mr. Lawrence joined the Cummins organization in 1948 as



**W. B. Lawrence**

Rocky Mountain regional manager in Denver, Colo. He will continue to serve as general manager of the eight dealerships operated by the corporation.

**Raymond M. Waggoner**, vice-president, sales, of Hubbard & Co., has been trans-

ferred to Oakland, Cal., as vice-president, Pacific Coast sales, and **Marshall Lasher** has been elected vice-president of Hubbard & Co. of California, and a director of Hubbard & Co.

Mr. Waggoner began his career with Hubbard in sales, with the electrical materials division, in September 1922. In 1928 he was promoted to assistant sales manager, Northeastern territory, and in 1936 was transferred to Chicago as sales manager of the Midwest territory. In the latter part of 1948 he was elected vice-president, sales, and a director of Hubbard & Co., at Pittsburgh, Pa., the position he held prior to his transfer to Oakland.

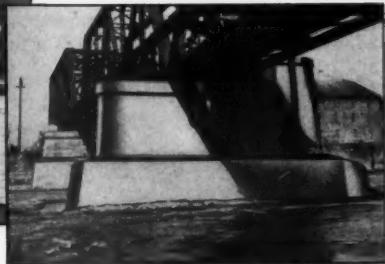
Mr. Lasher came to Hubbard in October 1922 and was employed as assistant manager of the railway track tool division, and in 1926 was transferred to the electrical materials division. In 1929 he was promoted to assistant manager of the Pittsburgh factory and later became assistant to the executive vice-president. In November 1945 he was transferred to Oakland as assistant to the late **W. W. Gossler**, vice-president and director of Hubbard, who died recently (R.E.M., May, p. 519).

**Charles C. Sons**, eastern service manager for the Cummins Engine Company, (Continued on page 708)

## With Detzel On the Job — There's NO INTERRUPTION IN SERVICE



Badly disintegrated and under-cut piers made bridge unsafe for heavily loaded trains.



Bridge completely restored to "like-new" condition by Geo. E. Detzel Co.



Coffer dams constructed by Geo. E. Detzel Co. permit work to proceed 20 feet below water level.

THIS railroad bridge in central Ohio was in danger of being "washed out" by a heavy flood. Its piers were badly disintegrated and the shale river bed had been eroded in some places as much as 10 feet below the original foundation.

George E. Detzel Co., noted for speed and efficiency on "tough jobs," worked around the clock to complete the job in the record time of nine weeks.

Racing against time and the elements, Detzel men and machines built cofferdams around 3 piers—excavated to a depth of 20 feet below water level; under-pinned and pressure-grouted three piers and an abutment, then encased piers with reinforced Gunite. Use of the modern Pumpcrete machine permitted a continuous pour of concrete (uninterrupted by passing trains) without a single weakening pour-seam.

Contact George E. Detzel Co. for maintenance problems along your right-of-way—no job is too big for their trained railroad crews, ready to tackle any job—anywhere.

**Consult DETZEL  
for these services**

Write for  
Illustrated  
Literature

Soil Stabilization  
Pressure Grouting  
Under-Pinning  
Gunite and Pumpcrete  
Restoration of Concrete and all Masonry Surfaces

Tunnel Maintenance  
Timber Trestles  
Sealing of Coffer dams  
Encasement of Piles



**GEORGE E. DETZEL COMPANY**

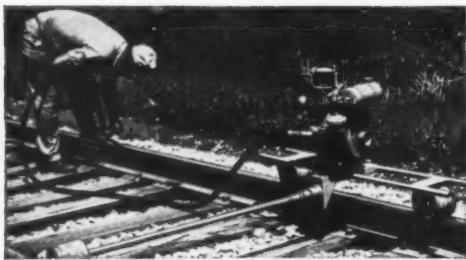
Contractors

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**Marshall Lasher**

# SPEED UP Small Grinding Jobs



Now, take on those grinding jobs that don't require "big power" . . . with this Mall 2 hp. Signal Bond Grinder. Easily and economically handle such grinding jobs as cleaning rail heads before the installation of welded type signal bonds. Peak-performing 4-cycle 2 hp. engine mounts outrigger for easy down-track travel . . . or lightweight base that swivels 360°. One man carries unit without tiring. Stand-the-gaff flexible shaft also mounts attachments for sanding, wire brushing, vibrating concrete, etc. Write for catalog No. 50.

with the  
**Mall**  
**2 Hp. Signal Bond  
GRINDER**



4-cycle 2 hp. engine unit,  
on 360° swivel base with  
shaft and vibrator.

40 Factory-Owned Service Warehouses, Coast to Coast,  
To Serve Our Customers and Thousands of Dealers.

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TOOL COMPANY

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## LARGE or SMALL . . .

**BURRO DOES EVERY JOB  
EFFICIENTLY,  
ECONOMICALLY**

Whether the Burro is used to speed track laying or relocation, for bridge building, earth or ballast handling or on locomotive coaling jobs, it will handle every job more efficiently and economically—because Burro Cranes are built for railroad work.

**Only BURRO cranes have:**

- Fast travel speeds—up to 22 M.P.H.
- Draw Bar Pull of 7500 lbs. (often eliminates need for work train or locomotive).
- Elevated Boom Heels for working over high sided gondolas.
- Short tail swing—will not foul adjoining track.
- Low overall height—Burro can be loaded and worked on a standard flat car (See illustration).

Write for Bulletins

CULLEN-FRIESTEDT CO.,

1301 S. Kilbourn Ave.,

Chicago 23, Illinois

**CULLEN-FRIESTEDT CO., CHICAGO 23, ILL.**

For additional information, use postcard, pages 655-656

## Supply Trade News (Cont'd)

Inc., Columbus, Ind., has been promoted to acting general service manager succeeding Harold H. Hall, who has been promoted to general manager of the Cummins Diesel Export Corporation at Columbus.

James E. Edelbrock has been appointed manager of the Chicago factory branch of Gar Wood Industries, succeeding Ross Miller who has assumed the position of vice-president and general manager of the National Lift Company, Waukesha, Wis., a subsidiary of Gar Wood Industries.

G. Donald Kennedy, assistant to the president and consulting engineer of the Portland Cement Association has been promoted to vice-president. W. D. M. Allan, director of promotion, has been promoted to vice-president for promotion.

P. L. McManus, resident salesman for the Worthington Corporation, Harrison, N. J., at Portland, Ore., has been promoted to manager of the San Francisco district office, succeeding H. W. King, who has been appointed regional manager, West Coast sales. Mr. King succeeds J. P. McArthur, who has been named manager of the Philadelphia sales office, succeeding the late W. J. Daly.

The Independent Pneumatic Tool Company, Aurora, Ill., has inaugurated a new Thor industrial sales division. In connection with the establishment of this division, G. A. Thoma has been appointed sales promotion manager, succeeding J. F. Corkery who has been promoted to manager of electric tool sales. Mr. Corkery succeeds J. A. Hill who has been promoted to manager of industrial sales.

Howard O. Wood has been appointed director of marketing and advertising for Bird & Son, Inc., East Walpole, Mass.

Robert Lange has been appointed manager of the Washington (D. C.) office of the Hyster Company, Portland, Ore.

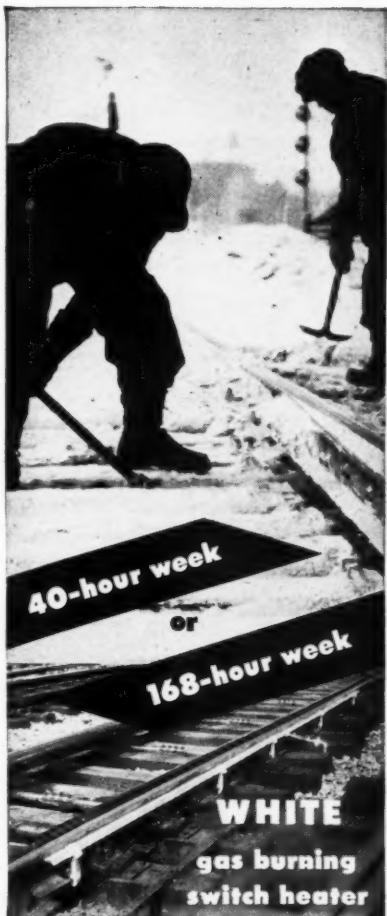
Leo E. Flinn has been given the responsibility for sales of the Dearborn Chemical Company's No-Ox-Id rust preventives to the railroad industry. Mr. Flinn will maintain headquarters in Chicago.

## Trade Publications

To obtain copies of any of the publications mentioned in these columns, use postcards, page 655.

**Weed Killers**—The Chipman Chemical Company, Bound Brook, N. J., has recently issued five data sheets covering Chipman railroad weed killers. Descriptions, uses, advantages, package sizes and directions for use are presented for Chlorax liquid, Atlas "A", Atlacid liquid, Atlacid spray powder, and Chlorax spray powder.

**Floor Care**—The A. C. Horn Company, Inc., Long Island City, N. Y., has recently issued a 12-page booklet as a guide for economical and efficient care of floors in all types of buildings. The il-



Which will you have next Winter? Trains tied up by snow-blocked switches and NO MEN to clean them?

or

**WHITE Switch Heaters**  
ready every minute? No overtime!  
Never fail in any blizzard. Installation amortized in two winters' use.

**Automatic control for remote switches**

Write for new bulletin

White  
Manufacturing  
Company

ELKHART 26, INDIANA

E. R. Mason, New York; John A. Roche, Chicago; Wm. H. Ziegler Co., Minneapolis; C. D. Hicks & Co., St. Louis.

Illustrated, two-color booklet covers conditioning, repairing and maintenance methods for a wide variety of floor materials including concrete, asphalt tile, cork, linoleum, magnesite, terrazzo, wood, and others, using Horn floor products.

**Tractor Maintenance**—The Caterpillar Tractor Company, Peoria, Ill., has recently made available a booklet entitled, "Prevent Down Time." Preventive maintenance, subject of the booklet, has been likened to preventive medicine—both try to reach the "patient" in time to prevent trouble. Illustrations in the 12-page, two-color booklet show the maintenance facilities offered by Caterpillar dealers.

**Wood Preservation**—A new industrial motion picture entitled, "Treat Wood Right" has recently been made available for showing to interested groups by the Dow Chemical Company, Midland, Mich. Running 20 minutes in length, the full color presentation describes the importance of wood preservation from tree to end use, and illustrates leading methods of wood treatment, with particular emphasis on the use of pentachlorophenol.

**Excavators**—Rules of excavator and crane operation and maintenance are listed and explained along with new ideas concerning operation, lubrication, adjustments and preventive maintenance, in an illustrated two-color booklet recently published by the Bucyrus-Erie Company, South Milwaukee, Wis. Titled, "Ways to Make Your Excavator Work Harder—Live Longer," the 32-page publication covers subjects of interest to economy-minded owners.

**Valves**—A new 16-page bulletin describing the features of Golden Anderson's cushioned altitude control valves is available from the Golden Anderson Valve Specialty Company, Pittsburgh, Pa. Featured in this catalog, designated as Bulletin W-4, are illustrations, operating sequence and installation arrangements of the various single and double-acting altitude control valves. General instructions, parts lists and dimensions are shown, along with a special section on maintenance.

**Jacks**—A new railroad jack bulletin, designated RR-52, has been issued by Templeton, Kenly & Co., Chicago, manufacturers of Simplex jacks. The six-page, letter-size folder is limited to jacks and equipment particularly suited to the railroad field. Profusely illustrated, it classifies 70 jacks into groups preferred by each of the various departments of railroad operation, construction and maintenance. The bulletin includes complete specifications of the jacks with suggestions and illustrations of many of their uses.

**Multi-Purpose Tractors**—The Gravely Motor Plow & Cultivator Co., Dunbar, W. Va., has recently issued a 24-page booklet entitled "Power vs. Drudgery," in which are described the various attachments which are available for use with the Gravely tractor. Illustrations in the two-color booklet show on-the-job applications of the tractor with attachments for plowing, cultivating, mowing, sawing, snow removal, hauling, spraying, posthole digging, and several others.

## LE-HI Makes a Good Connection

TOO!



### Specify LE-HI for all Hose Couplings!

Wherever hose is used there is a LE-HI hose coupling to match—from small tubing to large industrial applications.... The complete LE-HI line includes:

- Air Tool Couplings
- Welding Hose Couplings
- Steam Hose Couplings
- Fire Hose Couplings
- Acid Hose Couplings
- Sand and Blower Hose Couplings



SERIES 400

- Drilling Hose Couplings
- Oil and Gas Hose Couplings
- Agricultural Hose Couplings

... plus complete lines of hose clamps, air valves and manifolds.

Sold through leading distributors and rubber manufacturers only.

"Old Doc" says: "Write now for your free copy of the complete LE-HI catalog!"

### HOSE ACCESSORIES COMPANY

1720 Lehigh Ave.  
Philadelphia, Pa.

### LE-HI Makes a Good Connection!





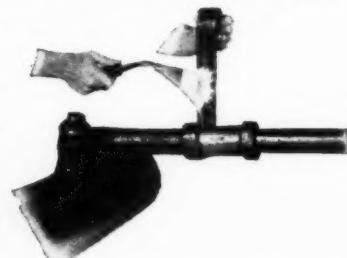
**Solve corrosion  
problems**  
**\*  
with TAPECOAT**  
**... the proved coal tar  
protection in handy  
tape form**

**The TAPECOAT Company**

More and more railroad maintenance men are depending on TAPECOAT to protect pipe joints and short pipe sections in underground service, at bridge crossings and wherever corrosion is a problem.

TAPECOAT is the coal tar protection in handy tape form. It comes in widths of 2, 3, 4, and 6 inches for spiral wrapping; and in widths of 18 and 24 inches for cigarette wrapping of large diameter pipe, tanks, etc.

Application is quick, easy, economical. Just a flash of a torch and TAPECOAT provides a perfect lasting bond to seal out the elements of corrosion.



TAPECOAT engineers have specialized in this protection for more than 10 years. Call on them to help you work out your individual requirements.

**Write for full details**

\*Reg. U. S. Pat. Off.

**Originators of the Coal Tar Tape for Pipe Joint Protection**

**1541 Lyons Street, Evanston, Illinois**

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# INEXPENSIVE TRACK INSURANCE

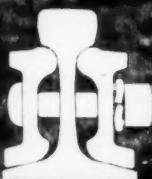
Our railway spring washers far more than pay for themselves by reducing maintenance costs—and in addition they improve your track.

Millions of Hipowers are in use today helping to prevent the battering of rail ends, absorbing shocks and stresses, equalizing bolt tensions, and keeping joints resilient.

Because of their great reserve power, your bolts need retightening far less frequently.

## IMPROVED HIPOWERS

### IMPROVE TRACK



NEW YORK CENTRAL PHOTO

THE NATIONAL LOCK WASHER COMPANY, NEWARK 5, N. J., U. S. A.

# THIS WAY TO BETTER ROADBED STABILIZATION

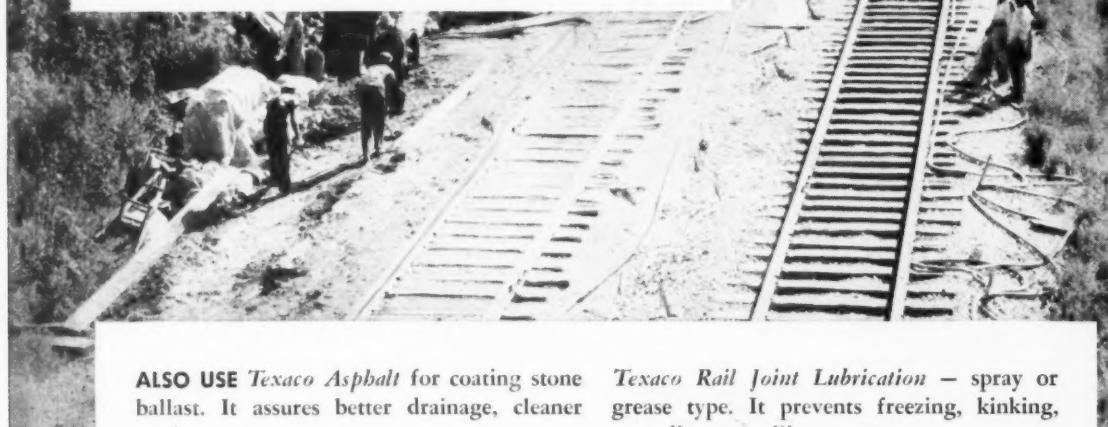
## ...the Texaco Asphalt-Cement method of pressure grouting

Leading railroads have found asphalt-cement pressure grouting the most effective, most lasting and economical way of eliminating "soft track." They have also found that the kind of asphalt used plays a big part in the success of the operation. That is why the choice is *Texaco No. 24 Emulsified Asphalt*—developed through field experience especially for this work.

A *lean* grouting mixture with *Texaco No. 24 Emulsified Asphalt* is most economical and effective. It penetrates more easily and thoroughly and seals better. It helps waterproof the soil and keep it resilient. The resulting stabilization is longer lasting. You gain important reductions in maintenance costs.

Let the Texaco Man tell you more about this low-cost, cost-saving method of track stabilization. Just call the nearest Railway Sales Office in New York, Chicago, San Francisco, St. Paul, St. Louis or Atlanta; or write:

The Texas Company, Railway Sales Department, 135 East 42nd Street, New York 17, N. Y.



**ALSO USE** *Texaco Asphalt* for coating stone ballast. It assures better drainage, cleaner track.

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